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RESEARCH MEMORANDUM

WIND-TUNNEL INVESTIGATION AT SUBSONIC AND SUPERSONIC SPEEDS OF A MODEL OF A TAILLESS FIGHTER AIRPLANE EMPLOYING A LOW-ASPECT-RATIO SWEPT-BACK WING - EFFECTS OF EXTERNAL FUEL TANKS AND ROCKET PACKETS ON THE DRAG CHARACTERISTICS

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NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

WASHINGTON

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RESEARCH MEMORANDUM

WIND-TUNNEL INVESTIGATION AT SUBSONIC AND SUPERSONIC SPEEDS OF A MODEL OF A TAILLESS FIGHTER AIRPLANE EMPLOYING A LOW-ASPECT-RATIO SWEPT-BACK WING - EFFECTS OF EXTERNAL FUEL TANKS AND ROCKET PACKETS ON THE DRAG CHARACTERISTICS

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SUMMARY

The effects of external fuel tanks and externally mounted rocket packets on the drag characteristics of a model of a tailless fighter airplane are presented in this report. The investigation was conducted through a Mach number range of 0.60 to 0.90 and 1.20 to 1.70 at a constant Reynolds number of 3.2 million. The measured lift, drag, pitching-moment, and rolling-moment coefficients and lift-drag ratios are presented in tabular form and the drag characteristics and lift-drag ratios are also presented in graphic form. In addition, pressure distribution data are tabulated which may be used to determine the influence of the external stores on the wing load distribution at supersonic speeds.

Results of this investigation show that the addition of two external fuel tanks and four faired rocket packets to the model produced drag increments which increased from 30 percent to 50 percent of the drag of the basic model between Mach numbers of 0.60 and 0.90, respectively, while at supersonic Mach numbers this drag increment was approximately 30 percent of the drag of the basic model. Tests of the model fitted with four rocket packets indicate that the drag may be reduced at subsonic speeds by fairing the open rocket packets, but at supersonic speeds the faired packets produced more drag. A small decrease in drag was realized at supersonic speeds, for the model fitted with two fuel tanks and four rocket packets, by mounting the outboard packets and fuel tanks in a more forward chordwise position with respect to the wing.

INTRODUCTION

Knowledge of the increases in drag to be expected from the addition of externally mounted fuel tanks and armament under the wings and fuselage becomes increasingly important as the trend continues toward long-range, high-speed fighter airplanes carrying rocket-propelled armament. An investigation of the effects of this type of external installation on the aerodynamic characteristics of a model having a low-aspect-ratio swept-back wing has been conducted in the Ames 6- by 6-foot supersonic wind tunnel. The model was fitted with various combinations of under-the-wing type rocket-packet and fuel-tank installations and tested at subsonic and supersonic Mach numbers at a constant Reynolds number. Two chordwise locations of the fuel tanks and rocket packets were investigated and the rocket packets were tested with the ends of the packets faired smooth and with the rocket tubes open. The results of this investigation are presented herein. The results of an investigation of the stability and control characteristics of this same model conducted in the Ames 6- by 6-foot supersonic wind tunnel are presented in reference 1.

NOTATION

The lift, drag, and pitching-moment coefficients are referred to the stability axes with the origin at the quarter-chord point of the mean aerodynamic chord projected to the fuselage center line. Rolling-moment coefficients are referred to the fuselage longitudinal axis.

b wing span, feet

c local wing chord measured parallel to plane of symmetry, feet

$\bar{c}$ wing mean aerodynamic chord $\left(\frac{\int_0^{b/2} c^2 dy}{\int_0^{b/2} c\, dy}\right)$, feet

C_D drag coefficient $\left(\frac{\text{drag}}{qS}\right)$

C_{D_s} increment of drag coefficient due to external-store installation or fuselage modification based on total wing area $(C_{D_{\text{model + store}}} - C_{D_{\text{model}}})$

C_L lift coefficient $\left(\frac{\text{lift}}{qS}\right)$

C_l rolling-moment coefficient $\left(\frac{\text{rolling moment}}{qSb}\right)$

C_m pitching-moment coefficient $\left(\frac{\text{pitching moment}}{qS\bar{c}}\right)$

C_p static pressure coefficient $\left(\frac{p-p_o}{q}\right)$

$\frac{L}{D}$ lift-drag ratio

$\left(\frac{L}{D}\right)_{max}$ maximum lift-drag ratio

M free-stream Mach number

p local static pressure, pounds per square foot

p_o free-stream static pressure, pounds per square foot

q free-stream dynamic pressure, pounds per square foot

R Reynolds number, based on the mean aerodynamic chord

S total projected wing area, including area formed by extending leading and trailing edges to plane of symmetry, square feet

Y spanwise distance from plane of symmetry, feet

α angle of attack of fuselage longitudinal axis, degrees

APPARATUS

Wind Tunnel and Equipment

The present investigation was conducted in the Ames 6- by 6-foot supersonic wind tunnel. This is a closed-return, variable-pressure wind tunnel in which the pressure and Mach number can be continuously varied. The stagnation pressure can be varied from 2 to 17 pounds per square inch absolute and the Mach number can be varied from 0.60 to 0.90 and from 1.15 to 2.00. A complete description of the wind tunnel is given in reference 2.

The model was sting mounted with the pitch plane of the model horizontal in the wind tunnel to utilize the most uniform stream conditions. (See reference 2). A four-component electrical strain-gage balance, similar in design to that used in reference 3, was enclosed within the fuselage of the model. The aerodynamic forces and moments were registered by recording-type galvanometers calibrated by applying known loads to the balance.

Model

A model of a high-speed fighter airplane having a low-aspect-ratio, swept-back wing and a swept-back vertical tail but not horizontal tail was used in this investigation (fig. 1). A bubble-type canopy was faired into a dorsal fin which extended back to the vertical tail. Provisions were made for fairing the vertical tail into the fuselage when the canopy and dorsal fin were removed. The wing had a leading-edge sweep angle of 52.5° and a taper ratio of 0.332 based on the theoretical wing tip. The wing was composed of symmetrical sections in streamwise planes having a thickness of 7.0 percent of the chord at the wing root tapering to 4.5 percent of the chord at the theoretical wing tip.

The model was fitted with inlets housed in wing-body juncture fairings with internal ducts allowing the air to flow through and exhaust at the rear of the fuselage. In this investigation the mass flow of air through the ducts was not adjustable; however, the ducts were constructed so that at supersonic speeds the exit was choked, limiting the inlet Mach number to 0.4. In order to accommodate the annular duct exit and the mounting sting, the boattailing on the model was somewhat less than would be expected on a full-scale airplane.

Rocket packets and fuel tanks were provided, to be attached to the wings in the locations shown in figures 2 and 3. The outboard rocket packets and the fuel tanks were mounted on unswept and swept-forward pylons as shown in figures 2 and 3. The purpose of the swept-forward pylons was to obtain a more forward location of these stores. The rocket packets were tested both with the fore and aft ends of the rocket packet faired smooth and with six holes open through the packet, to simulate conditions before and after firing the rockets.

Provisions were made to measure pressure distribution data at five spanwise stations as shown in figure 4. The location of the orifices on the upper and lower surfaces of the port wing are given in table I.

TESTS AND PROCEDURE

As a basis for comparison, tests were made of the basic model with canopy and dorsal fin in place and with no external stores installed. Lift, drag, pitching-moment, and rolling-moment data were obtained at Mach numbers of 0.60, 0.80, 0.90, 1.20, 1.35, 1.50, and 1.70 at a constant Reynolds number of 3.2 million, through an angle of attack range of -2° to $+8^{\circ}$. Similar data were then obtained at corresponding test conditions for the following model configurations:

1. Basic model fitted with inboard and outboard faired rocket packets mounted on unswept pylons

2. Basic model fitted with inboard and outboard open-tube rocket packets mounted on unswept pylons

3. Basic model fitted with two external fuel tanks mounted on unswept pylons

4. Basic model fitted with inboard and outboard faired rocket packets and two external fuel tanks all mounted on unswept pylons

5. Basic model fitted with outboard faired rocket packets and two external fuel tanks mounted on swept pylons and inboard faired rocket packets mounted on unswept pylons

6. Basic model with canopy and dorsal fin removed (no external stores)

Pressure distribution data were obtained for the basic model and for the model fitted with four faired rocket packets mounted on straight pylons. These tests were conducted at Mach numbers of 1.20, 1.30, and 1.70 at a Reynolds number of 2.0 million. Data were obtained through an angle-of-attack range of -3° to $+12^{\circ}$ at 2° increments for the basic model and 4° increments for tests of the model fitted with the rocket packets. A tabulation of the test conditions is presented in table II.

Reduction of Data

The test data have been reduced to standard NACA coefficient form based on the total projected wing area including the area in the region formed by extending the leading and trailing edges to the plane of symmetry (fig. 1). Factors which could affect the accuracy of these results and the corrections applied are discussed in the following paragraphs.

Angle of attack.- The determination of the actual angle of attack of the model under load required several corrections to be applied to the nominal angle. Corrections, determined from static load calibrations, were applied for the angular deflection of the sting and balance under aerodynamic load and for the angular movement due to structural clearance in the model support and balance. These corrections amounted to from 5 to 10 percent of the nominal angle, depending on the load.

Tunnel-wall interference.- Corrections to the data for the effects of the tunnel walls at subsonic speeds were made by the method of reference 4. These corrections which were added to the data were as follows:

$$\Delta\alpha = 0.377\ C_L$$

$$\Delta C_D = 0.0066\ {C_L}^2$$

The reflected bow wave did not intersect the model and so no tunnel-wall corrections were made for supersonic Mach numbers.

The effect of constriction of the flow at subsonic speeds due to the presence of the model was taken into account by the method of reference 5. This correction was calculated for conditons of zero angle of attack and was applied through the angle-of-attack range. At a Mach number of 0.90, this correction amounted to a 1-percent increase in Mach number and dynamic pressure over those values determined from calibrations of the wind tunnel without a model in place.

Support interference.- Results of a wind-tunnel test of a similar model (reference 6) show that the effects of support interference consisted primarily of a change of pressure at the base of the model. In this test the base pressure was measured and corrections were applied to adjust the pressure at the base to free-stream static pressure.[1] The drag values are, therefore, forebody drag coefficients.

Stream variations.- Tests were made at subsonic and supersonic speeds with the model in upright and inverted attitudes. Results of these tests showed no measurable indications of stream angle or stream curvature in the horizontal plane of the wind tunnel. Stream surveys of the Ames 6- by 6-foot supersonic wind tunnel (reference 2) show some curvature in the vertical plane of the wind tunnel, but the results of a subsequent investigation (reference 7) indicate that this curvature has little effect on the longitudinal aerodynamic characteristics of the model when pitched in the horizontal plane.

Internal duct drag.- The model was equipped with twin ducts through which air could flow. However, provisions were not made to vary the mass flow, so a study of the duct drag characteristics was not feasible in this investigation. The drag data presented herein are for the complete model; that is, the drag due to flow through the ducts has not been subtracted from the final drag coefficients.

Precision of Data

The accuracy of the test results, excluding stream effects, is shown by the repeatability of the data. Examination of the results showed the data to repeat with the accuracy shown in the following table:

[1]The base area used in this investigation was the entire base area of the model less the duct exit area.

Quantity	Accuracy $C_L = 0$	Accuracy $C_L = 0.25$
C_D	±0.0004	±0.0006
C_L	±.0016	±.0018
C_m	±.0005	±.0005
C_l	±.0006	±.0009
C_p	±.005	±.005
M	±.03	±.03
R	$\pm.03 \times 10^6$	$\pm.03 \times 10^6$
α	±.1	±.15

The precision of the data presented herein is superior to that of the data in reference 1 because these data were obtained for a consecutive series of tests in the wind tunnel and the mounting of the model and balance was unchanged during this investigation.

RESULTS AND DISCUSSION

Only the data pertinent to a study of the effects of external fuel tanks and rocket packets on the drag characteristics of the model are discussed in this report. All the force and moment data obtained from these tests, including lift and rolling-moment coefficients and lift-drag ratios, are presented in table III, however. In addition, experimental static pressure coefficients obtained at Mach numbers of 1.20, 1.30, and 1.70 for the basic model and for the model fitted with four rocket packets are presented in table IV. Comparison of the data from these pressure distribution tests gives an indication of the effects of the rocket-packet installation on the air loads experienced by the model.

The effects of external stores on the drag characteristics of the model are presented in this report as the increments of drag coefficient incurred by the addition of external stores. Figure 5 presents the variation of drag coefficient with lift coefficient for the basic model at Mach numbers of 0.60, 0.80, 0.90, 1.20, 1.35, 1.50, and 1.70. As previously mentioned, the drag coefficients presented in this report include the internal duct drag. The increments of drag coefficient for the various store installations investigated are shown in figure 6 as a function of Mach number for 0 and 0.25 lift coefficients. This figure shows that at subsonic speeds the drag increment resulting from the addition of four rocket packets was somewhat less when the packets were faired, but at supersonic speeds fairing the packets increased the drag. The drag increments for two fuel tanks and four rocket packets, mounted in the aft chordwise location (unswept pylons), varied from approximately 30 percent of the drag of the basic model at a Mach number of 0.60 to 50 percent at a Mach number of 0.90. For Mach numbers of 1.20 to 1.70 the drag increment for these same external-store configurations was approximately 30 percent of the drag of the basic model. Results of tests of the model with the stores mounted in two chordwise locations showed that the change in chordwise location had no significant effect on the drag at subsonic speeds. At supersonic speeds, however, the drag increment resulting from the addition of two fuel tanks and four rocket packets was somewhat smaller for the forward chordwise location (swept pylons).

The maximum lift-drag ratios for all the configurations tested are shown in figure 7 as a function of Mach number. These data are for the unbalanced model.

Results of this investigation show that the addition of external stores could appreciably affect the trim drag of the model. This effect is illustrated in figure 8 which shows the variation of pitching-moment coefficient with lift coefficient for the basic model and for the model fitted with two external fuel tanks and four rocket packets. The magnitude of the pitching-moment coefficient at zero lift for the basic model was quite small at all Mach numbers, but the model fitted with external stores showed a significant negative pitching moment at subsonic speeds and a positive pitching moment at supersonic speeds. These pitching moments, associated with the installation of external stores on the model, significantly influence the deflection of the longitudinal control surface required for a specific flight condition. Thus it should be noted that the drag coefficients presented for this investigation are for the unbalanced model and that the total drag for the model balanced with a control device will include an additional drag increment or decrement due to the change in control setting required to counteract the aerodynamic influence of the external store. Pitching-moment characteristics are shown for the model fitted with two fuel tanks and four rocket packets because they exhibit the most pronounced effects of external stores of all the configurations investigated.

CONCLUSIONS

The following conclusions are based on a wind-tunnel investigation of the effects of external fuel tanks and externally mounted rocket packets on the drag characteristics of a model of a tailless fighter airplane:

1. The drag increase resulting from the addition of two external fuel tanks and four faired rocket packets varied from 30 percent of the drag of the basic model at 0.60 Mach number to 50 percent of the drag of the basic model at 0.90 Mach number. At Mach numbers of 1.20 to 1.70, this drag increment was approximately 30 percent of the drag of the basic model.

2. The drag coefficient, at subsonic speeds, for the model fitted with four faired rocket packets was smaller than with four open rocket packets. At supersonic speeds the four faired packets produced greater drag increments than the open packets.

3. The drag coefficients for the model fitted with two fuel tanks and four faired rocket packets were somewhat less, at supersonic speeds, with the outboard rocket packets and fuel tanks in a forward chordwise location. At subsonic speeds the chordwise location caused no significant effect on the drag characteristics.

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[redacted]

TABLE III.- CONTINUED

(c) Tests 24 through 38

Test No.	α	C_L	C_D	C_m	C_l	L/D
24	-0.43	-0.036	0.0420	0.015	-0.0002	- - -
	-2.19	-.134	.0476	.033	-.0002	- - -
	.55	.012	.0409	.006	-.0004	0.29
	2.20	.101	.0427	-.009	-.0004	2.36
	4.37	.230	.0535	-.034	-.0005	4.30
	6.54	.366	.0754	-.065	-.0001	4.86
	8.69	.493	.1068	-.095	.0006	4.62
25	-.40	-.022	.0425	.012	-.0011	- - -
	-2.16	-.112	.0476	.031	-.0010	- - -
	.56	.022	.0418	.003	-.0012	.53
	2.20	.106	.0442	-.015	-.0015	2.40
	4.35	.224	.0555	-.041	-.0015	4.04
	6.49	.340	.0755	-.069	-.0009	4.50
	8.64	.451	.1038	-.094	-.0001	4.35
26	-.40	-.017	.0425	.011	-.0018	- - -
	-2.15	-.101	.0472	.030	-.0015	- - -
	.56	.022	.0420	.002	-.0019	.52
	2.19	.099	.0446	-.016	-.0020	2.22
	4.32	.203	.0549	-.041	-.0018	3.70
	6.45	.309	.0729	-.067	-.0016	4.24
	8.58	.410	.0984	-.092	-.0013	4.17
27	-0.40	-0.014	0.0436	0.008	-0.0007	- - -
	-2.13	-.087	.0471	.024	-.0003	- - -
	.54	.018	.0430	0	-.0009	.42
	2.16	.085	.0455	-.016	-.0013	1.87
	4.27	.174	.0542	-.037	-.0017	3.21
	6.38	.265	.0694	-.060	-.0019	3.82
	8.49	.354	.0912	-.082	-.0021	3.88
28	-.56	-.031	.0134	-.006	-.0011	- - -
	-2.20	-.110	.0160	-.004	-.0013	- - -
	.40	.011	.0132	-.007	-.0011	.84
	2.15	.095	.0146	-.010	-.0008	6.49
	4.32	.202	.0200	-.016	-.0007	10.07
	6.48	.317	.0329	-.023	.0002	9.62
	8.65	.440	.0572	-.034	.0009	7.69
29	-0.60	-0.036	0.0147	-0.008	-0.0010	- - -
	-2.27	-.123	.0190	-.005	-.0012	- - -
	.38	.008	.0141	-.009	-.0010	0.57
	2.19	.101	.0152	-.012	-.0009	6.65
	4.40	.219	.0218	-.018	-.0006	10.02
	6.61	.350	.0406	-.028	.0006	8.62
	8.83	.487	.0748	-.043	.0012	6.52
30	-.63	-.048	.0187	-.009	-.0011	- - -
	-2.33	-.146	.0255	-.001	-.0011	- - -
	.48	.004	.0170	-.011	-.0011	.23
	2.20	.106	.0173	-.015	-.0010	6.11
	4.46	.243	.0254	-.023	-.0008	9.56
	6.73	.409	.0505	-.046	-.0004	8.10
	8.92	.514	.0871	-.055	- - -	5.90
31	-.44	-.048	.0466	.019	0	- - -
	-2.19	-.145	.0533	.039	0	- - -
	.53	- - -	.0451	.010	0	- - -
	2.19	.090	.0455	-.006	-.0004	1.98
	4.36	.221	.0552	-.033	-.0006	4.01
	6.52	.358	.0760	-.065	0	4.71
	8.67	.487	.1066	-.096	- - -	4.57
32	-.40	-.027	.0468	.018	-.0011	- - -
	-2.04	-.115	.0522	.036	-.0011	- - -
	.57	.018	.0459	.008	-.0012	.39
	2.20	.100	.0476	-.010	-.0016	2.10
	4.35	.217	.0577	-.038	-.0014	3.76
	6.49	.335	.0772	-.067	-.0009	4.34
	8.63	.444	.1045	-.093	-.0002	4.25
33	-.39	-.020	.0466	.016	-.0018	- - -
	-2.02	-.101	.0513	.033	-.0015	- - -
	.58	.022	.0460	.006	-.0019	.48
	2.20	.098	.0481	-.012	-.0020	2.04
	4.33	.202	.0577	-.038	-.0018	3.50
	6.45	.304	.0747	-.064	-.0016	4.07
	8.58	.406	.0996	-.089	-.0013	4.08
34	-.39	-.012	.0474	.010	.0011	- - -
	-2.01	-.083	.0509	.026	0	- - -
34	0.56	0.022	0.0470	0.002	-0.0007	0.47
	2.17	.088	.0490	-.013	-.0010	1.80
	4.28	.176	.0576	-.034	-.0014	3.05
	6.39	.265	.0720	-.057	-.0016	3.68
	8.50	.354	.0934	-.079	-.0019	3.79
35	-.56	-.029	.0135	-.008	-.0011	- - -
	-2.21	-.110	.0162	-.006	-.0013	- - -
	.39	.011	.0132	-.009	-.0011	.83
	1.05	.039	.0135	-.009	-.0010	2.88
	2.15	.094	.0146	-.011	-.0010	6.42
	4.32	.203	.0202	-.016	-.0005	10.06
	6.48	.320	.0335	-.023	.0001	9.56
	8.65	.439	.0549	-.033	.0011	8.00
36	-.60	-.036	.0148	-.010	-.0009	- - -
	-2.28	-.124	.0194	-.008	-.0010	- - -
	.38	.009	.0142	-.011	-.0011	.63
	1.05	.038	.0142	-.012	-.0010	2.67
	2.19	.102	.0154	-.013	-.0008	6.61
	4.40	.221	.0221	-.019	-.0006	9.99
	6.62	.352	.0410	-.028	.0004	8.58
	8.85	.490	.0720	-.040	.0005	6.81
37	-.64	-.046	.0188	-.012	-.0010	- - -
	-2.35	-.149	.0260	-.006	-.0013	- - -
	.48	.006	.0171	-.013	-.0010	.35
	.94	.039	.0168	-.014	-.0011	2.33
	2.21	.108	.0175	-.016	-.0010	6.16
	4.46	.247	.0260	-.023	-.0008	9.50
	6.73	.409	.0504	-.044	-.0001	8.12
	8.94	.532	.0878	-.060	.0006	6.06
38	-.42	-.047	.0461	.016	-.0003	- - -
	-2.10	-.146	.0521	.036	-.0001	- - -
	.63	.003	.0447	.005	-.0003	.07
	1.18	.031	.0447	0	-.0004	.70
	2.29	.091	.0456	-.011	-.0004	1.99
	4.46	.224	.0556	-.038	-.0006	4.02
	6.62	.362	.0774	-.070	-.0001	4.68
	8.78	.491	.1082	-.100	.0010	4.54

[redacted]

TABLE III.- CONCLUDED

(d) Tests 39 through 48

Test No.	α	C_L	C_D	C_m	C_l	L/D
39	-0.40	-0.025	0.0460	0.015	-0.0012	----
	-2.16	-.115	.0511	.033	-.0003	----
	.57	.020	.0454	.006	-.0014	0.44
	1.11	.044	.0456	.001	-.0015	.96
	2 20	.101	.0475	-.012	-.0018	2.12
	4.35	.219	.0581	-.039	-.0015	3.77
	6.49	.337	.0774	-.067	-.0009	4.36
	8.63	.445	.1048	-.093	0	4.24
40	-.39	-.018	.0457	.013	-.0017	----
	-2.14	-.102	.0498	.030	-.0014	----
	.57	.024	.0454	.004	-.0020	.53
	1.11	.044	.0456	-.001	-.0021	.96
	2.20	.099	.0478	-.014	-.0020	2.07
	4.33	.205	.0578	-.039	-.0018	3.55
	6.46	.309	.0752	-.065	-.0015	4.11
	8.58	.408	.1001	-.089	-.0011	4.08
41	-.39	-.011	.0462	.007	-.0008	----
	-2.13	-.085	.0496	.024	-.0003	----
	.55	.020	.0460	0	-.0009	.44
	1.09	.043	.0460	-.005	-.0010	.93
	2.17	.090	.0482	-.016	-.0012	1.87
	4.28	.179	.0570	-.036	-.0015	3.14
	6.40	.268	.0719	-.058	-.0017	3.72
	8.51	.358	.0937	-.080	-.0018	3.82
42	-.54	-.020	.0109	-.003	-.0013	----
	-1.08	-.044	.0112	-.002	-.0014	----
	-3.26	-.149	.0153	.003	-.0014	----
	-6.50	-.321	.0338	.017	-.0017	----
	.53	.021	.0108	-.005	-.0012	1.95
	1.08	.049	.0112	-.006	-.0010	4.39
	2.16	.101	.0127	-.008	-.0010	7.97
	4.33	.206	.0185	-.015	-.0006	11.12
	6.48	.318	.0322	-.024	.0002	9.87
	8.65	.441	.0560	-.036	.0011	7.88
	10.82	.566	.0932	-.048	.0015	6.07
	12.96	.665	.1373	-.055	.0015	4.84
	15.08	.750	.1879	-.064	.0013	3.99

Test No.	α	C_L	C_D	C_m	C_l	L/D
42	17.21	0.824	0.2433	-0.069	0.0005	3.39
	19.29	.875	.2984	-.076	.0007	2.93
	21.33	.901	.3499	-.086	-.0005	2.58
43	-.56	-.024	.0110	-.003	-.0011	----
	-1.11	-.051	.0115	-.002	-.0012	----
	-3.32	-.163	.0165	.004	-.0012	----
	-6.64	-.359	.0420	.022	-.0015	----
	.53	.020	.0110	-.005	-.0011	1.82
	1.09	.051	.0113	-.006	-.0011	4.51
	2.21	.108	.0130	-.010	-.0010	8.28
	4.40	.223	.0205	-.017	-.0008	10.90
	6.61	.351	.0398	-.028	.0005	8.82
	8.82	.486	.0723	-.045	.0005	6.72
	11.00	.593	.1138	-.056	.0011	5.21
	13.15	.676	.1590	-.062	.0023	4.25
	15.26	.737	.2038	-.069	.0005	3.62
	17.36	.797	.2566	-.078	.0008	3.10
44	-.57	-.029	.0109	-.002	-.0013	----
	-1.14	-.058	.0114	0	-.0013	----
	-3.39	-.189	.0185	.010	-.0015	----
	.53	.019	.0108	-.004	-.0011	1.76
	1.11	.053	.0111	-.006	-.0011	4.77
	2.25	.117	.0132	-.011	-.0010	8.88
	4.48	.249	.0230	-.023	-.0008	10.83
	6.73	.412	.0508	-.050	-.0002	8.12
	8.92	.510	.0828	-.055	----	6.16
45	-.54	-.024	.0351	.004	-.0001	----
	-3.28	-.182	.0443	.034	.0004	----
	-6.52	-.383	.0743	.078	.0007	----
	.54	.021	.0348	-.004	.0024	.60
	1.09	.053	.0352	-.009	.0025	1.51
	2.19	.113	.0376	-.020	.0025	3.01
	4.35	.238	.0490	-.047	.0027	4.86
	6.51	.372	.0703	-.077	----	5.29
	8.66	.499	.1017	-.106	.0010	4.91
	10.81	.613	.1405	-.131	.0017	4.36
	12.96	.696	.1799	-.140	.0055	3.87

Test No.	α	C_L	C_D	C_m	C_l	L/D
46	-0.54	-0.022	0.0355	0.003	-0.0009	----
	-1.09	-.051	.0363	.009	-.0009	----
	-3.25	-.162	.0442	.033	-.0006	----
	-6.47	-.340	.0718	.074	-.0002	----
	.52	.017	.0352	-.004	-.0010	0.48
	1.08	.046	.0353	-.010	-.0011	1.30
	2.17	.102	.0374	-.022	-.0012	2.73
	4.31	.214	.0480	-.047	-.0010	4.46
	6.45	.330	.0671	-.075	-.0006	4.92
	8.59	.442	.0946	-.102	----	4.67
	10.73	.541	.1648	-.127	.0009	3.28
	12.86	.644	.1716	-.149	.0013	3.75
47	-.54	-.022	.0345	.004	-.0015	----
	-1.09	-.049	.0352	.009	-.0015	----
	-3.24	-.152	.0434	.032	-.0010	----
	-6.44	-.310	.0689	.070	-.0006	----
	.52	.014	.0344	-.004	-.0016	.41
	1.07	.040	.0346	-.010	-.0017	1.16
	2.16	.092	.0368	-.021	-.0019	2.50
	4.28	.194	.0466	-.045	-.0018	4.17
	6.41	.298	.0638	-.070	-.0015	4.67
	8.54	.397	.0883	-.095	-.0012	4.50
	10.66	.491	.1196	-.118	-.0008	4.11
	12.78	.580	.1568	-.139	-.0008	3.70
48	-.54	-.019	.0346	.001	-.0008	----
	-1.08	-.042	.0353	.006	-.0006	----
	-3.22	-.134	.0425	.028	-.0002	----
	-6.39	-.271	.0636	.059	.0008	----
	.40	.012	.0342	-.006	-.0010	.35
	.94	.035	.0345	-.011	-.0010	1.01
	2.13	.082	.0366	-.022	-.0012	2.24
	4.24	.172	.0454	-.043	-.0015	3.79
	6.36	.261	.0602	-.064	-.0017	4.33
	8.47	.348	.0819	-.085	-.0017	4.25
	10.58	.430	.1089	-.105	-.0016	3.95
	12.69	.508	.1414	-.124	-.0017	3.59

TABLE IV.- EXPERIMENTAL PRESSURE COEFFICIENTS, C_p

(a) Basic model, M = 1.2

Orifice No.	Angle of attack									
	-3°	-1°	0°	1°	2°	4°	6°	8°	10°	12°
0	1.354	1.377	1.386	1.388	1.399	1.384	1.392	1.392	1.376	1.352
1	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
2	.489	.438	.404	.381	.355	.296	.256	.207	.153	.116
3	.409	.358	.326	.303	.280	.229	.190	.147	.098	.067
4	.607	.596	.581	.567	.533	.440	.380	.385	.271	.228
5	.560	.520	.495	.476	.452	.403	.368	.334	.286	.264
6	-.022	-.062	-.081	-.096	-.113	-.146	-.168	-.192	.197	-.240
7	-.345	-.387	-.406	-.417	-.431	-.447	-.442	-.415	-.405	-.393
8	.108	.104	-.095	.103	.095	.082	-.069	.077	.071	.074
9	.002	-.034	-.049	-.068	-.088	-.128	-.162	-.190	-.228	-.251
10	.059	.018	-.003	-.016	-.035	-.070	-.094	-.112	-.147	-.159
11	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
12	.109	.158	.181	.215	.248	.293	.361	.417	.469	.533
13	-.093	-.066	-.047	-.017	.002	.040	.097	.145	.187	.250
14	-.072	-.055	-.034	.015	.002	.038	.082	.123	.153	.205
15	.232	.239	.237	.245	.252	.256	.260	.270	.265	.264
16	.160	-.056	-.037	-.008	.014	.058	.120	.180	.237	.291
17	.516	.420	-.355	.299	.162	.177	.119	.003	-.093	-.158
18	.008	-.083	-.136	-.183	-.222	-.301	-.361	-.444	-.522	-.571
19	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
20	-.114	-.178	-.209	-.239	-.268	-.332	-.388	-.452	-.514	-.557
21	.024	-.006	.017	-.061	-.085	-.131	-.167	-.207	-.261	-.368
22	.094	.044	.022	-.005	-.018	-.073	-.115	-.153	-.197	-.226
23	.069	.028	.001	-.022	-.050	-.094	-.126	-.163	-.199	-.226
24	.053	.010	-.017	-.038	-.058	-.096	-.130	-.165	-.205	-.229
25	.055	-.007	-.037	-.060	-.081	-.128	-.159	-.193	-.235	-.251
26	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
27	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
28	-.264	-.313	-.325	-.330	-.344	-.366	-.323	-.245	-.214	-.173
29	-.424	-.365	-.331	-.276	-.222	-.085	.065	.164	.305	.409
30	-.473	-.458	-.424	-.386	-.309	-.234	.088	.036	.155	.256
31	-.146	-.115	-.110	-.082	-.068	-.044	.005	.043	.087	.142
32	-.097	-.067	-.046	-.010	.005	.041	.087	.139	.194	.291
33	-.111	-.086	-.065	.060	-.009	.041	.113	.178	.233	.300

Orifice No.	Angle of attack									
	-3°	-1°	0°	1°	2°	4°	6°	8°	10°	12°
34	-0.103	-0.078	-0.061	0.062	-0.005	0.041	0.109	0.165	0.222	0.295
34A	-.115	-.074	-.062	-.030	-.003	.038	.101	.164	.223	.290
35	-.126	-.104	-.085	-.053	-.032	.018	.074	.138	.187	.237
36	-.141	-.117	-.102	-.069	-.052	-.003	.046	.097	.135	.188
37	-.226	-.218	-.203	-.172	-.157	-.121	-.081	-.041	-.007	.038
38	-.318	-.351	-.353	-.340	-.333	-.304	-.277	-.251	-.227	-.185
39	.179	.030	-.052	-.124	-.218	-.358	-.479	-.584	-.678	-.737
40	.077	-.024	-.088	-.172	-.243	-.348	-.465	-.570	-.658	-.706
41	.046	-.032	-.083	-.126	-.175	-.331	-.446	-.545	-.624	-.675
42	.032	-.036	-.074	-.112	-.115	-.167	-.248	-.420	-.579	-.642
43	-.016	-.046	-.079	-.094	-.122	-.175	-.209	-.266	-.469	-.603
44	-.040	-.103	-.129	-.160	-.184	-.232	-.269	-.296	-.310	-.300
45	-.067	-.103	-.123	-.144	-.168	-.212	-.248	-.286	-.312	-.286
46	-.030	-.085	-.107	-.126	-.152	-.196	-.223	-.259	-.279	-.283
47	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
48	.029	-.081	-.113	-.124	-.139	-.166	-.204	-.240	-.275	-.198
49	-.239	-.137	-.054	-.010	.086	.191	.284	.372	.451	.522
50	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
51	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
52	-.222	-.161	-.118	-.072	-.040	.030	.102	.182	.247	.324
53	-.160	-.137	-.116	-.079	-.054	.012	.079	.146	.209	.279
54	-.209	-.186	-.163	-.129	-.112	-.055	.003	.056	.094	.153
55	-.178	-.175	-.154	-.123	-.108	-.068	-.029	.009	.041	.085
56	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
57	-.052	-.126	-.138	-.121	-.109	-.083	-.045	-.010	.051	.075
58	-.164	-.177	-.168	-.149	-.141	-.102	-.071	-.033	.005	.050
59	.185	.056	-.026	-.124	-.227	-.389	-.522	-.631	-.716	-.747
60	.047	-.064	-.144	-.195	-.261	-.436	-.532	-.611	-.689	-.733
61	.027	-.068	-.119	-.174	-.226	-.398	-.507	-.606	-.679	-.723
62	.016	-.052	-.092	-.143	-.193	-.228	-.427	-.544	-.625	-.701
63	-.004	-.069	-.103	-.141	-.148	-.209	-.317	-.463	-.563	-.652
64	-.033	-.098	-.126	-.143	-.175	-.215	-.264	-.404	-.535	-.624
65	-.078	-.138	-.172	-.197	-.221	-.263	-.290	-.372	-.500	-.570
66	-.096	-.149	-.174	-.191	-.217	-.259	-.291	-.346	-.441	-.494

Orifice No.	Angle of attack									
	-3°	-1°	0°	1°	2°	4°	6°	8°	10°	12°
67	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
68	-0.063	-0.131	-0.156	-0.164	-0.184	-0.222	-0.262	-0.320	-0.401	-0.451
69	.009	-.056	-.109	-.128	-.138	-.147	-.173	-.228	-.314	-.352
70	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
71	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
72	-.343	-.259	-.208	-.138	-.069	.015	.102	.185	.266	.347
73	-.304	-.200	-.145	-.094	-.055	.022	.098	.174	.245	.306
74	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
75	-.223	-.192	-.172	-.138	-.118	-.064	.001	.061	.107	.165
76	-.218	-.191	-.174	-.167	-.153	-.100	-.044	.013	.051	.104
77	-.216	-.208	-.193	-.176	-.170	-.127	-.064	-.020	.015	.059
78	-.169	-.158	-.137	-.116	-.097	-.037	.014	.031	.054	.103
79	-.201	-.186	-.152	-.154	-.135	-.090	-.052	-.017	.026	.079
80	-.166	-.175	-.152	-.158	-.140	-.116	-.088	-.051	-.018	.033
81	.224	-.032	-.028	-.130	-.243	-.448	-.583	-.679	-.728	-.736
82	.043	-.072	-.156	-.245	-.316	-.466	-.582	-.665	-.710	-.729
83	-.008	-.086	-.142	-.194	-.276	-.438	-.572	-.666	-.712	-.709
84	.001	-.056	-.103	-.155	-.214	-.355	-.499	-.589	-.622	-.649
85	-.018	-.071	-.103	-.132	-.156	-.205	-.323	-.437	-.535	-.592
86	-.087	-.149	-.182	-.191	-.211	-.244	-.278	-.366	-.498	-.526
87	-.167	-.228	-.266	-.285	-.291	-.336	-.374	-.401	-.508	-.542
88	-.155	-.204	-.219	-.236	-.251	-.284	-.312	-.321	-.439	-.486
89	-.086	-.169	-.199	-.222	-.240	-.256	-.237	-.236	-.408	-.472
90	-.428	-.234	-.113	-.002	-.032	.170	.328	.399	.448	.481
91	-.461	-.321	-.228	-.160	-.089	.024	.124	.214	.286	.355
92	-.394	-.294	-.218	-.144	-.091	.005	.085	.169	.230	.293
93	-.333	-.234	-.166	-.105	-.079	-.007	.086	.172	.222	.279
94	-.188	-.177	-.158	-.118	-.103	-.060	-.003	.044	.088	.135
95	-.242	-.244	-.251	-.219	-.196	-.168	-.108	-.060	-.020	.023
96	-.260	-.245	-.235	-.216	-.217	-.165	-.105	-.045	-.017	.011
97	-.223	-.217	-.216	-.206	-.203	-.147	-.106	-.073	-.037	.031
98	-.182	-.205	-.209	-.205	-.195	-.148	-.114	-.079	-.040	.003

NACA

TABLE IV.- CONTINUED

(b) Basic model, M = 1.3

Orifice No.	Angle of attack									
	-3°	-1°	0°	1°	2°	4°	6°	8°	10°	12°
0	1.438	1.437	1.442	1.449	1.463	1.459	1.454	1.445	1.432	1.411
1	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
2	.523	.470	.433	.411	.389	.336	.291	.244	.203	.156
3	.432	.386	.356	.322	.310	.262	.219	.176	.140	.099
4	.662	.590	.526	.485	.459	.397	.346	.296	.253	.209
5	.599	.554	.520	.498	.479	.440	.396	.351	.315	.275
6	.047	.021	-.008	-.027	-.038	-.063	-.098	-.124	-.145	-.171
7	-.287	-.303	-.325	-.318	-.353	-.359	-.388	-.395	-.382	-.362
8	-.004	.037	.055	.065	.075	.072	.074	.065	.062	.059
9	.072	.050	.027	.012	.008	-.019	-.033	-.048	-.065	-.091
10	.064	.042	.015	.008	-.007	-.042	-.068	-.092	-.117	-.146
11	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
12	.157	.188	.215	.248	.280	.332	.039	.436	.497	.552
13	-.044	-.029	-.011	.011	.038	.069	.115	.156	.208	.258
14	-.044	-.029	-.013	.006	.024	.049	.093	.132	.170	.212
15	.240	.235	.231	.232	.243	.243	.252	.258	.259	.262
16	-.062	-.055	-.039	-.020	.004	.040	.088	.134	.190	.243
17	.602	.524	.463	.411	.367	.302	.259	.147	.075	.002
18	.076	.010	-.037	-.087	-.119	-.176	-.240	-.300	-.360	-.407
19	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
20	-.127	-.161	-.194	-.223	-.243	-.290	-.339	-.390	-.435	-.473
21	-.049	-.087	-.126	-.143	-.163	-.209	-.246	-.286	-.331	-.387
22	.085	.052	.021	-.004	-.023	-.061	-.096	-.130	-.160	-.197
23	.059	.026	.001	-.025	-.040	-.077	-.111	-.143	-.171	-.206
24	.054	.021	-.005	-.025	-.043	-.075	-.109	-.141	-.169	-.203
25	.029	0	-.033	-.053	-.068	-.107	-.138	-.171	-.201	-.229
26	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
27	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
28	-.262	-.280	-.296	-.309	-.317	-.340	-.359	-.379	-.394	-.412
29	-.305	-.281	-.240	-.201	-.141	-.034	.134	.181	.375	.420
30	-.386	-.393	-.379	-.355	-.319	-.257	-.151	-.045	.107	.183
31	-.139	-.129	-.094	-.070	-.053	-.030	.019	.058	.137	.144
32	-.078	-.069	-.053	-.029	-.001	.026	.065	.111	.182	.215
33	-.109	-.089	-.065	-.041	-.012	.024	.078	.130	.209	.252

Orifice No.	Angle of attack									
	-3°	-1°	0°	1°	2°	4°	6°	8°	10°	12°
34	-0.104	-0.091	-0.068	-0.046	-0.021	0.020	0.072	0.126	0.200	0.248
34A	-.084	-.059	-.032	-.011	-.014	.056	.102	.164	.217	.277
35	-.119	-.077	-.087	-.066	-.038	0	.049	.096	.153	.203
36	-.144	-.131	-.110	-.088	-.060	-.030	.017	.066	.113	.169
37	-.226	-.215	-.206	-.182	-.160	-.126	-.082	-.043	.001	.039
38	-.337	-.335	-.331	-.320	-.299	-.287	-.257	-.225	-.190	-.155
39	.141	.078	.001	-.074	-.128	-.230	-.322	-.403	-.469	-.535
40	.035	-.027	-.184	-.154	-.209	-.294	-.371	-.438	-.498	-.543
41	.031	-.008	-.059	-.107	-.159	-.260	-.350	-.421	-.478	-.536
42	.029	-.006	-.056	-.084	-.094	-.147	-.234	-.333	-.413	-.484
43	.007	-.023	-.054	-.080	-.101	-.140	-.184	-.260	-.338	-.416
44	-.060	-.089	-.114	-.141	-.160	-.196	-.227	-.264	-.297	-.367
45	-.080	-.100	-.123	-.141	-.160	-.192	-.225	-.260	-.276	-.277
46	-.048	-.073	-.103	-.129	-.142	-.181	-.206	-.234	-.248	-.256
47	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
48	-.054	-.080	-.102	-.126	-.138	-.169	-.202	-.231	-.253	-.255
49	-.242	-.163	-.080	-.005	.076	.164	.257	.335	.414	.475
50	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
51	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
52	-.200	-.171	-.135	-.095	-.057	-.001	.066	.139	.216	.283
53	-.162	-.150	-.126	-.093	-.061	-.006	.055	.114	.178	.235
54	-.197	-.182	-.160	-.134	-.104	-.066	-.017	.032	.087	.143
55	-.193	-.180	-.163	-.139	-.114	-.084	-.037	.007	.052	.091
56	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
57	-.154	-.161	-.151	-.140	-.126	-.101	-.068	-.029	.017	.057
58	-.195	-.193	-.181	-.163	-.139	-.111	-.067	-.033	-.014	.054
59	.192	.097	-.010	-.071	-.139	-.241	-.343	-.428	-.495	-.553
60	.042	-.015	-.104	-.183	-.243	-.333	-.410	-.477	-.531	-.579
61	.023	-.030	-.086	-.139	-.195	-.288	-.371	-.438	-.494	-.547
62	.019	-.028	-.075	-.123	-.178	-.290	-.378	-.443	-.506	-.552
63	.001	-.036	-.076	-.102	-.119	-.165	-.286	-.380	-.441	-.488
64	.030	-.067	-.097	-.119	-.136	-.174	-.216	-.307	-.382	-.440
65	-.094	-.116	-.142	-.170	-.179	-.215	-.246	-.310	-.380	-.443
66	-.107	-.135	-.158	-.178	-.193	-.218	-.251	-.298	-.348	-.404

Orifice No	Angle of attack									
	-3°	-1°	0	1°	2°	4°	6°	8°	10°	12°
67	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
68	-0.098	-0.129	-0.151	-0.163	-0.178	-0.207	-0.236	-0.286	-0.346	-0.415
69	-.072	-.092	-.111	-.131	-.146	-.172	-.199	-.234	-.277	-.298
70	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
71	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
72	-.289	-.250	-.198	-.150	-.101	-.023	.068	.158	.233	.310
73	-.253	-.217	-.160	-.109	-.068	.001	.075	.156	.219	.286
74	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
75	-.201	-.193	-.170	-.138	-.112	-.067	-.011	.055	.103	.166
76	-.210	-.193	-.174	-.156	-.137	-.100	-.047	.019	.066	.120
77	-.216	-.203	-.188	-.172	-.156	-.129	-.076	-.015	.025	.068
78	-.175	-.154	-.137	-.127	-.102	-.063	-.012	.035	.063	.100
79	-.207	-.190	-.178	-.164	-.140	-.102	-.055	-.009	.027	.070
80	-.210	-.196	-.183	-.167	-.148	-.115	-.077	-.039	-.005	.038
81	.220	.136	.030	-.065	-.143	-.272	-.378	-.477	-.526	-.576
82	.041	-.031	-.100	-.189	-.255	-.341	-.424	-.481	-.541	-.582
83	-.002	-.054	-.117	-.192	-.269	-.360	-.439	-.504	-.558	-.585
84	.005	-.033	-.083	-.133	-.190	-.301	-.391	-.458	-.523	-.558
85	-.011	-.037	-.078	-.114	-.145	-.235	-.331	-.406	-.472	-.513
86	-.088	-.109	-.136	-.155	-.177	-.209	-.260	-.325	-.389	-.450
87	-.178	-.197	-.221	-.242	-.257	-.283	-.312	-.343	-.386	-.446
88	-.177	-.193	-.207	-.213	-.225	-.244	-.273	-.290	-.328	-.398
89	-.152	-.170	-.079	-.209	-.224	-.241	-.243	-.134	-.261	-.359
90	-.311	-.199	-.086	.013	.087	.186	.287	.367	.427	.479
91	-.365	-.296	-.210	-.148	-.091	-.009	.090	.179	.249	.330
92	-.388	-.351	-.258	-.192	-.127	-.033	.059	.144	.212	.283
93	-.297	-.258	-.202	-.139	-.091	-.023	.060	.143	.204	.275
94	-.234	-.217	-.186	-.147	-.112	-.076	-.024	.035	.083	.139
95	-.255	-.241	-.222	-.203	-.184	-.158	-.114	-.058	-.019	.030
96	-.264	-.245	-.225	-.207	-.188	-.162	-.114	-.055	.003	.037
97	-.228	-.213	-.204	-.195	-.183	-.156	-.110	-.065	-.027	.020
98	-.229	-.212	-.203	-.192	-.186	-.162	-.118	-.075	-.035	.008

TABLE III.- CONTINUED

(c) Tests 24 through 38

Test No.	α	C_L	C_D	C_m	C_l	L/D
24	-0.43	-0.036	0.0420	0.015	-0.0002	- - -
	-2.19	-.134	.0476	.033	-.0002	- - -
	.55	.012	.0409	.006	-.0004	0.29
	2.20	.101	.0427	-.009	-.0004	2.36
	4.37	.230	.0535	-.034	-.0005	4.30
	6.54	.366	.0754	-.065	-.0001	4.86
	8.69	.493	.1068	-.095	.0006	4.62
25	-.40	-.022	.0425	.012	-.0011	- - -
	-2.16	-.112	.0476	.031	-.0010	- - -
	.56	.022	.0418	.003	-.0012	.53
	2.20	.106	.0442	-.015	-.0015	2.40
	4.35	.224	.0555	-.041	-.0015	4.04
	6.49	.340	.0755	-.069	-.0009	4.50
	8.64	.451	.1038	-.094	-.0001	4.35
26	-.40	-.017	.0425	.011	-.0018	- - -
	-2.15	-.101	.0472	.030	-.0015	- - -
	.56	.022	.0420	.002	-.0019	.52
	2.19	.099	.0446	-.016	-.0020	2.22
	4.32	.203	.0549	-.041	-.0018	3.70
	6.45	.309	.0729	-.067	-.0016	4.24
	8.58	.410	.0984	-.092	-.0013	4.17
27	-0.40	-0.014	0.0436	0.008	-0.0007	- - -
	-2.13	-.087	.0471	.024	-.0003	- - -
	.54	.018	.0430	0	-.0009	.42
	2.16	.085	.0455	-.016	-.0013	1.87
	4.27	.174	.0542	-.037	-.0017	3.21
	6.38	.265	.0694	-.060	-.0019	3.82
	8.49	.354	.0912	-.082	-.0021	3.88
28	-.56	-.031	.0134	-.006	-.0011	- - -
	-2.20	-.110	.0160	-.004	-.0013	- - -
	.40	.011	.0132	-.007	-.0011	.84
	2.15	.095	.0146	-.010	-.0008	6.49
	4.32	.202	.0200	-.016	-.0007	10.07
	6.48	.317	.0329	-.023	.0002	9.62
	8.65	.440	.0572	-.034	.0009	7.69
29	-0.60	-0.036	0.0147	-0.008	-0.0010	- - -
	-2.27	-.123	.0190	-.005	-.0012	- - -
	.38	.008	.0141	-.009	-.0010	0.57
	2.19	.101	.0152	-.012	-.0009	6.65
	4.40	.219	.0218	-.018	-.0006	10.02
	6.61	.350	.0406	-.028	.0006	8.62
	8.83	.487	.0748	-.043	.0012	6.52
30	-.63	-.048	.0187	-.009	-.0011	- - -
	-2.33	-.146	.0255	-.001	-.0011	- - -
	.48	.004	.0170	-.011	-.0011	.23
	2.20	.106	.0173	-.015	-.0010	6.11
	4.46	.243	.0254	-.023	-.0008	9.56
	6.73	.409	.0505	-.046	-.0004	8.10
	8.92	.514	.0871	-.055	- - -	5.90
31	-.44	-.048	.0466	.019	0	- - -
	-2.19	-.145	.0533	.039	0	- - -
	.53	- - -	.0421	.010	0	- - -
	2.19	.090	.0455	-.006	-.0004	1.98
	4.36	.221	.0552	-.033	-.0006	4.01
	6.52	.358	.0760	-.065	0	4.71
	8.67	.487	.1066	-.096	- - -	4.57
32	-.40	-.027	.0468	.018	-.0011	- - -
	-2.04	-.115	.0522	.036	-.0011	- - -
	.57	.018	.0459	.008	-.0012	.39
	2.20	.100	.0476	-.010	-.0016	2.10
	4.35	.217	.0577	-.038	-.0014	3.76
	6.49	.335	.0772	-.067	-.0009	4.34
	8.63	.444	.1045	-.093	-.0002	4.25
33	-.39	-.020	.0466	.016	-.0018	- - -
	-2.02	-.101	.0513	.033	-.0015	- - -
	.58	.022	.0460	.006	-.0019	.48
	2.20	.098	.0481	-.012	-.0020	2.04
	4.33	.202	.0577	-.038	-.0018	3.50
	6.45	.304	.0747	-.064	-.0016	4.07
	8.58	.406	.0996	-.089	-.0013	4.08
34	-.39	-.012	.0474	.010	.0011	- - -
	-2.01	-.083	.0509	.026	0	- - -
34	0.56	0.022	0.0470	0.002	-0.0007	0.47
	2.17	.088	.0490	-.013	-.0010	1.80
	4.28	.176	.0576	-.034	-.0014	3.05
	6.39	.265	.0720	-.057	-.0016	3.68
	8.50	.354	.0934	-.079	-.0019	3.79
35	-.56	-.029	.0135	-.008	-.0011	- - -
	-2.21	-.110	.0162	-.006	-.0013	- - -
	.39	.011	.0132	-.009	-.0011	.83
	1.05	.039	.0135	-.009	-.0010	2.88
	2.15	.094	.0146	-.011	-.0010	6.42
	4.32	.203	.0202	-.016	-.0005	10.06
	6.48	.320	.0335	-.023	.0001	9.56
	8.65	.439	.0549	-.033	.0011	8.00
36	-.60	-.036	.0148	-.010	-.0009	- - -
	-2.28	-.124	.0194	-.008	-.0010	- - -
	.38	.009	.0142	-.011	-.0011	.63
	1.05	.038	.0142	-.012	-.0010	2.67
	2.19	.102	.0154	-.013	-.0008	6.61
	4.40	.221	.0221	-.019	-.0006	9.99
	6.62	.352	.0410	-.028	.0004	8.58
	8.85	.490	.0720	-.040	.0005	6.81
37	-.64	-.046	.0188	-.012	-.0010	- - -
	-2.35	-.149	.0260	-.006	-.0013	- - -
	.48	.006	.0171	-.013	-.0010	.35
	.94	.039	.0168	-.014	-.0011	2.33
	2.21	.108	.0175	-.016	-.0010	6.16
	4.46	.247	.0260	-.023	-.0008	9.50
	6.73	.409	.0504	-.044	-.0001	8.12
	8.94	.532	.0878	-.060	.0006	6.06
38	-.42	-.047	.0461	.016	-.0003	- - -
	-2.10	-.146	.0521	.036	-.0001	- - -
	.63	.003	.0447	.005	-.0003	.07
	1.18	.031	.0447	0	-.0004	.70
	2.29	.091	.0456	-.011	-.0004	1.99
	4.46	.224	.0556	-.038	-.0006	4.02
	6.62	.362	.0774	-.070	-.0001	4.68
	8.78	.491	.1082	-.100	.0010	4.54

[redacted]

TABLE III.- CONCLUDED

(d) Tests 39 through 48

Test No.	α	C_L	C_D	C_m	C_l	L/D
39	-0.40	-0.025	0.0460	0.015	-0.0012	----
	-2.16	-.115	.0511	.033	-.0003	----
	.57	.020	.0454	.006	-.0014	0.44
	1.11	.044	.0456	.001	-.0015	.96
	2 20	.101	.0475	-.012	-.0018	2.12
	4.35	.219	.0581	-.039	-.0015	3.77
	6.49	.337	.0774	-.067	-.0009	4.36
	8.63	.445	.1048	-.093	0	4.24
40	-.39	-.018	.0457	.013	-.0017	----
	-2.14	-.102	.0498	.030	-.0014	----
	.57	.024	.0454	.004	-.0020	.53
	1.11	.044	.0456	-.001	-.0021	.96
	2.20	.099	.0478	-.014	-.0020	2.07
	4.33	.205	.0578	-.039	-.0018	3.55
	6.46	.309	.0752	-.065	-.0015	4.11
	8.58	.408	.1001	-.089	-.0011	4.08
41	-.39	-.011	.0462	.007	-.0008	----
	-2.13	-.085	.0496	.024	-.0003	----
	.55	.020	.0460	0	-.0009	.44
	1.09	.043	.0460	-.005	-.0010	.93
	2.17	.090	.0482	-.016	-.0012	1.87
	4.28	.179	.0570	-.036	-.0015	3.14
	6.40	.268	.0719	-.058	-.0017	3.72
	8.51	.358	.0937	-.080	-.0018	3.82
42	-.54	-.020	.0109	-.003	-.0013	----
	-1.08	-.044	.0112	-.002	-.0014	----
	-3.26	-.149	.0153	.003	-.0014	----
	-6.50	-.321	.0338	.017	-.0017	----
	.53	.021	.0108	-.005	-.0012	1.95
	1.08	.049	.0112	-.006	-.0010	4.39
	2.16	.101	.0127	-.008	-.0010	7.97
	4.33	.206	.0185	-.015	-.0006	11.12
	6.48	.318	.0322	-.024	.0002	9.87
	8.65	.441	.0560	-.036	.0011	7.88
	10.82	.566	.0932	-.048	.0015	6.07
	12.96	.665	.1373	-.055	.0015	4.84
	15.08	.750	.1879	-.064	.0013	3.99
42	17.21	0.824	0.2433	-0.069	0.0005	3.39
	19.29	.875	.2984	-.076	.0007	2.93
	21.33	.901	.3499	-.086	-.0005	2.58
43	-.56	-.024	.0110	-.003	-.0011	----
	-1.11	-.051	.0115	-.002	-.0012	----
	-3.32	-.163	.0165	.004	-.0012	----
	-6.64	-.359	.0420	.022	-.0015	----
	.53	.020	.0110	-.005	-.0011	1.82
	1.09	.051	.0113	-.006	-.0011	4.51
	2.21	.108	.0130	-.010	-.0010	8.28
	4.40	.223	.0205	-.017	-.0008	10.90
	6.61	.351	.0398	-.028	.0005	8.82
	8.82	.486	.0723	-.045	.0005	6.72
	11.00	.593	.1138	-.056	.0011	5.21
	13.15	.676	.1590	-.062	.0023	4.25
	15.26	.737	.2038	-.069	.0005	3.62
	17.36	.797	.2566	-.078	.0008	3.10
44	-.57	-.029	.0109	-.002	-.0013	----
	-1.14	-.058	.0114	0	-.0013	----
	-3.39	-.189	.0185	.010	-.0015	----
	.53	.019	.0108	-.004	-.0011	1.76
	1.11	.053	.0111	-.006	-.0011	4.77
	2.25	.117	.0132	-.011	-.0010	8.88
	4.48	.249	.0230	-.023	-.0008	10.83
	6.73	.412	.0508	-.050	-.0002	8.12
	8.92	.510	.0828	-.055	----	6.16
45	-.54	-.024	.0351	.004	-.0001	----
	-3.28	-.182	.0443	.034	.0004	----
	-6.52	-.383	.0743	.078	.0007	----
	.54	.021	.0348	-.004	.0024	.60
	1.09	.053	.0352	-.009	.0025	1.51
	2.19	.113	.0376	-.020	.0025	3.01
	4.35	.238	.0490	-.047	.0027	4.86
	6.51	.372	.0703	-.077	----	5.29
	8.66	.499	.1017	-.106	.0010	4.91
	10.81	.613	.1405	-.131	.0017	4.36
	12.96	.696	.1799	-.140	.0055	3.87
46	-0.54	-0.022	0.0355	0.003	-0.0009	----
	-1.09	-.051	.0363	.009	-.0009	----
	-3.25	-.162	.0442	.033	-.0006	----
	-6.47	-.340	.0718	.074	-.0002	----
	.52	.017	.0352	-.004	-.0010	0.48
	1.08	.046	.0353	-.010	-.0011	1.30
	2.17	.102	.0374	-.022	-.0012	2.73
	4.31	.214	.0480	-.047	-.0010	4.46
	6.45	.330	.0671	-.075	-.0006	4.92
	8.59	.442	.0946	-.102	----	4.67
	10.73	.541	.1648	-.127	.0009	3.28
	12.86	.644	.1716	-.149	.0013	3.75
47	-.54	-.022	.0345	.004	-.0015	----
	-1.09	-.049	.0352	.009	-.0015	----
	-3.24	-.152	.0434	.032	-.0010	----
	-6.44	-.310	.0689	.070	-.0006	----
	.52	.014	.0344	-.004	-.0016	.41
	1.07	.040	.0346	-.010	-.0017	1.16
	2.16	.092	.0368	-.021	-.0019	2.50
	4.28	.194	.0466	-.045	-.0018	4.17
	6.41	.298	.0638	-.070	-.0015	4.67
	8.54	.397	.0883	-.095	-.0012	4.50
	10.66	.491	.1196	-.118	-.0008	4.11
	12.78	.580	.1568	-.139	-.0008	3.70
48	-.54	-.019	.0346	.001	-.0008	----
	-1.08	-.042	.0353	.006	-.0006	----
	-3.22	-.134	.0425	.028	-.0002	----
	-6.39	-.271	.0636	.059	.0008	----
	.40	.012	.0342	-.006	-.0010	.35
	.94	.035	.0345	-.011	-.0010	1.01
	2.13	.082	.0366	-.022	-.0012	2.24
	4.24	.172	.0454	-.043	-.0015	3.79
	6.36	.261	.0602	-.064	-.0017	4.33
	8.47	.348	.0819	-.085	-.0017	4.25
	10.58	.430	.1089	-.105	-.0016	3.95
	12.69	.508	.1414	-.124	-.0017	3.59

[redacted]

TABLE IV.- EXPERIMENTAL PRESSURE COEFFICIENTS, C_p

(a) Basic model, M = 1.2

Orifice No.	Angle of attack									
	-3°	-1°	0°	1°	2°	4°	6°	8°	10°	12°
0	1.354	1.377	1.386	1.388	1.399	1.394	1.392	1.392	1.376	1.352
1	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
2	.489	.438	.404	.381	.355	.296	.256	.207	.153	.116
3	.409	.358	.326	.303	.280	.229	.190	.147	.098	.067
4	.607	.596	.581	.567	.533	.440	.380	.325	.271	.228
5	.560	.520	.495	.476	.452	.403	.368	.334	.286	.264
6	-.022	-.062	-.081	-.096	-.113	-.146	-.168	-.192	.197	-.240
7	-.345	-.387	-.406	-.417	-.431	-.447	-.442	-.415	-.405	-.393
8	.108	.104	-.095	.103	.095	.082	-.069	.077	.071	.074
9	.002	-.034	-.049	-.068	-.088	-.128	-.162	-.190	-.228	-.251
10	.059	.018	-.003	-.016	-.035	-.070	-.094	-.112	-.147	-.159
11	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
12	.109	.158	.181	.215	.248	.293	.361	.417	.469	.533
13	-.093	-.066	-.047	-.017	.002	.040	.097	.145	.187	.250
14	-.072	-.055	-.034	.015	.002	.038	.082	.123	.153	.205
15	.232	.239	.237	.245	.252	.256	.260	.270	.265	.264
16	.160	-.056	-.037	-.008	.014	.056	.120	.180	.237	.291
17	.516	.420	-.355	.299	.162	.177	.119	.003	-.093	-.158
18	.008	-.083	-.136	-.183	-.222	-.302	-.361	-.444	-.522	-.571
19	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
20	-.114	-.178	-.209	-.239	-.268	-.332	-.388	-.452	-.514	-.577
21	.084	-.006	.017	-.061	-.085	-.131	-.167	-.207	-.261	-.368
22	.094	.044	.022	-.005	-.018	-.073	-.115	-.153	-.197	-.226
23	.069	.028	.001	-.022	-.050	-.094	-.126	-.163	-.199	-.226
24	.053	.010	-.017	-.038	-.058	-.096	-.130	-.165	-.205	-.229
25	.055	-.007	-.037	-.060	-.081	-.128	-.159	-.193	-.235	-.251
26	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
27	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
28	-.264	-.313	-.325	-.330	-.344	-.366	-.323	-.245	-.214	-.173
29	-.424	-.365	-.331	-.276	-.222	-.085	.065	.164	.305	.409
30	-.473	-.458	-.424	-.386	-.309	-.234	.088	.036	.155	.256
31	-.146	-.115	-.110	-.082	-.068	-.044	.005	.043	.087	.142
32	-.097	-.067	-.046	-.010	.005	.041	.087	.139	.194	.291
33	-.111	-.086	-.065	.060	-.009	.041	.113	.178	.233	.300

Orifice No.	Angle of attack									
	-3°	-1°	0°	1°	2°	4°	6°	8°	10°	12°
34	-0.103	-0.078	-0.061	0.062	-0.005	0.041	0.109	0.165	0.222	0.295
34A	-.115	-.074	-.062	-.030	-.003	.038	.101	.164	.223	.290
35	-.126	-.104	-.085	-.053	-.032	.018	.074	.138	.187	.237
36	-.141	-.117	-.102	-.069	-.052	-.003	.046	.097	.135	.188
37	-.226	-.218	-.203	-.172	-.157	-.121	-.081	-.041	-.007	.038
38	-.318	-.351	-.373	-.340	-.333	-.304	-.277	-.251	-.227	-.185
39	.179	.030	-.052	-.124	-.218	-.358	-.479	-.584	-.678	-.737
40	.077	-.024	-.088	-.172	-.243	-.348	-.465	-.570	-.658	-.706
41	.046	-.032	-.083	-.126	-.175	-.331	-.446	-.545	-.624	-.675
42	.032	-.036	-.074	-.112	-.115	-.167	-.248	-.420	-.559	-.642
43	-.016	-.046	-.079	-.094	-.122	-.175	-.209	-.266	-.469	-.603
44	-.040	-.103	-.129	-.160	-.184	-.232	-.269	-.296	-.310	-.300
45	-.067	-.103	-.123	-.144	-.168	-.212	-.248	-.286	-.312	-.286
46	-.030	-.085	-.107	-.126	-.152	-.196	-.223	-.259	-.279	-.283
47	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
48	.029	-.081	-.113	-.124	-.139	-.166	-.204	-.240	-.275	-.198
49	-.239	-.137	-.054	-.010	.086	.191	.284	.372	.451	.522
50	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
51	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
52	-.222	-.161	-.118	-.072	-.040	.030	.102	.182	.247	.324
53	-.160	-.137	-.116	-.079	-.054	.012	.079	.146	.209	.279
54	-.209	-.186	-.163	-.129	-.112	-.055	.003	.056	.094	.153
55	-.178	-.175	-.154	-.123	-.108	-.068	-.029	.009	.041	.085
56	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
57	-.052	-.126	-.138	-.121	-.109	-.083	-.045	-.010	.051	.075
58	-.164	-.177	-.168	-.149	-.141	-.102	-.071	-.033	.005	.050
59	.185	.056	-.026	-.124	-.227	-.389	-.522	-.631	-.716	-.747
60	.047	-.064	-.144	-.195	-.261	-.436	-.532	-.611	-.689	-.733
61	.027	-.068	-.119	-.174	-.226	-.398	-.507	-.606	-.679	-.723
62	.016	-.052	-.092	-.143	-.193	-.228	-.427	-.544	-.625	-.701
63	-.004	-.069	-.103	-.141	-.148	-.209	-.317	-.463	-.563	-.652
64	-.033	-.098	-.126	-.143	-.175	-.215	-.264	-.404	-.535	-.624
65	-.078	-.138	-.172	-.197	-.221	-.263	-.290	-.372	-.500	-.570
66	-.096	-.149	-.174	-.191	-.217	-.259	-.291	-.346	-.441	-.494

Orifice No.	Angle of attack									
	-3°	-1°	0°	1°	2°	4°	6°	8°	10°	12°
67	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
68	-0.063	-0.131	-0.156	-0.164	-0.184	-0.222	-0.262	-0.320	-0.401	-0.451
69	.009	-.056	-.109	-.128	-.138	-.147	-.173	-.228	-.314	-.332
70	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
71	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
72	-.343	-.259	-.208	-.138	-.089	.015	.102	.185	.266	.347
73	-.304	-.200	-.145	-.094	-.055	.022	.098	.174	.245	.306
74	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
75	-.223	-.192	-.172	-.138	-.118	-.064	.001	.061	.107	.165
76	-.218	-.191	-.174	-.167	-.153	-.100	-.044	.013	.051	.104
77	-.216	-.208	-.193	-.176	-.170	-.127	-.064	-.020	.015	.059
78	-.169	-.158	-.137	-.116	-.097	-.037	.014	.031	.054	.103
79	-.201	-.186	-.152	-.154	-.135	-.090	-.052	-.017	.026	.079
80	-.166	-.175	-.152	-.158	-.140	-.116	-.088	-.051	-.018	.033
81	.224	-.032	-.028	-.130	-.243	-.448	-.583	-.679	-.728	-.736
82	.043	-.072	-.156	-.245	-.316	-.466	-.582	-.665	-.710	-.729
83	-.008	-.086	-.142	-.194	-.276	-.438	-.572	-.666	-.712	-.709
84	.001	-.056	-.103	-.155	-.214	-.355	-.499	-.589	-.622	-.649
85	-.018	-.071	-.103	-.132	-.156	-.205	-.323	-.437	-.535	-.592
86	-.087	-.149	-.182	-.191	-.211	-.244	-.278	-.366	-.458	-.526
87	-.167	-.228	-.266	-.285	-.291	-.336	-.374	-.401	-.508	-.542
88	-.155	-.204	-.219	-.256	-.251	-.284	-.312	-.321	-.439	-.486
89	-.086	-.169	-.199	-.222	-.240	-.256	-.237	-.236	-.408	-.472
90	-.426	-.234	-.113	-.002	-.032	.170	.326	.399	.446	.481
91	-.461	-.321	-.226	-.160	-.089	.024	.124	.214	.286	.355
92	-.394	-.294	-.218	-.144	-.091	.005	.085	.169	.230	.293
93	-.333	-.234	-.166	-.105	-.079	-.007	.086	.172	.222	.279
94	-.188	-.177	-.158	-.118	-.103	-.060	-.003	.044	.088	.135
95	-.242	-.244	-.251	-.219	-.196	-.168	-.108	-.060	-.020	.023
96	-.260	-.245	-.235	-.216	-.217	-.165	-.105	-.045	-.017	.011
97	-.223	-.217	-.216	-.206	-.203	-.147	-.106	-.073	-.037	.031
98	-.182	-.205	-.209	-.205	-.195	-.148	-.114	-.079	-.040	.003

TABLE IV.- CONTINUED

(b) Basic model, M = 1.3

Orifice No.	Angle of attack									
	-3°	-1°	0°	1°	2°	4°	6°	8°	10°	12°
0	1.438	1.437	1.442	1.449	1.463	1.459	1.454	1.445	1.432	1.411
1	---	---	---	---	---	---	---	---	---	---
2	.523	.470	.433	.411	.389	.336	.291	.244	.203	.156
3	.432	.386	.356	.322	.310	.262	.219	.176	.140	.099
4	.662	.590	.526	.485	.459	.397	.346	.296	.253	.209
5	.599	.574	.520	.498	.479	.440	.396	.351	.315	.275
6	.047	.021	-.008	-.027	-.038	-.063	-.098	-.124	-.145	-.171
7	-.287	-.303	-.325	-.318	-.353	-.359	-.388	-.395	-.382	-.362
8	-.004	.037	.055	.065	.075	.072	.074	.065	.062	.059
9	.072	.050	.027	.012	.008	-.019	-.033	-.048	-.065	-.091
10	.064	.042	.015	.002	-.007	-.042	-.068	-.092	-.117	-.146
11	---	---	---	---	---	---	---	---	---	---
12	.157	.188	.215	.248	.280	.332	.039	.436	.497	.552
13	-.044	-.029	-.011	.011	.038	-.069	.115	.156	.208	.258
14	-.044	-.029	-.013	.006	.024	.049	.093	.132	.170	.212
15	.240	.235	.231	.232	.243	.243	.252	.258	.259	.262
16	-.062	-.055	-.039	-.020	.004	.040	.088	.134	.190	.243
17	.602	.524	.463	.411	.367	.302	.259	.147	.075	.002
18	.076	.010	-.037	-.087	-.119	-.176	-.240	-.300	-.360	-.407
19	---	---	---	---	---	---	---	---	---	---
20	-.127	-.161	-.194	-.223	-.243	-.290	-.339	-.390	-.435	-.473
21	-.049	-.087	-.126	-.143	-.163	-.209	-.246	-.286	-.331	-.387
22	.085	.052	.021	-.004	-.023	-.061	-.096	-.130	-.160	-.197
23	.059	.026	.001	-.025	-.040	-.077	-.111	-.143	-.171	-.206
24	.054	.021	-.005	-.025	-.043	-.075	-.109	-.141	-.169	-.203
25	.029	0	-.033	-.053	-.068	-.107	-.138	-.171	-.201	-.229
26	---	---	---	---	---	---	---	---	---	---
27	---	---	---	---	---	---	---	---	---	---
28	-.262	-.280	-.296	-.309	-.317	-.340	-.359	-.379	-.394	-.412
29	-.305	-.281	-.240	-.201	-.141	-.034	.134	.181	.375	.420
30	-.386	-.393	-.379	-.355	-.319	-.257	-.151	-.045	.107	.183
31	-.139	-.129	-.094	-.070	-.053	-.030	.019	.058	.137	.144
32	-.078	-.069	-.053	-.029	-.001	.026	.065	.111	.182	.215
33	-.109	-.089	-.065	-.041	-.012	.024	.078	.130	.209	.252

Orifice No.	Angle of attack									
	-3°	-1°	0°	1°	2°	4°	6°	8°	10°	12°
34	-0.104	-0.091	-0.068	-0.046	-0.021	0.020	0.072	0.126	0.200	0.248
34A	-.084	-.059	-.032	-.011	-.014	.056	.102	.164	.217	.277
35	-.119	-.077	-.087	-.066	-.038	0	.049	.096	.153	.203
36	-.144	-.131	-.110	-.088	-.060	-.030	.017	.066	.113	.169
37	-.226	-.215	-.206	-.182	-.160	-.186	-.082	-.043	.001	.039
38	-.337	-.335	-.331	-.320	-.299	-.287	-.257	-.225	-.190	-.155
39	.141	.078	.001	-.074	-.128	-.230	-.322	-.403	-.469	-.535
40	.035	-.027	-.184	-.154	-.209	-.294	-.371	-.438	-.498	-.543
41	.031	-.008	-.059	-.107	-.159	-.260	-.350	-.421	-.478	-.536
42	.029	-.006	-.056	-.084	-.094	-.147	-.234	-.333	-.413	-.484
43	.007	-.023	-.054	-.080	-.101	-.140	-.184	-.260	-.338	-.416
44	-.060	-.089	-.114	-.141	-.160	-.196	-.227	-.264	-.297	-.367
45	-.080	-.100	-.123	-.141	-.160	-.192	-.225	-.260	-.276	-.277
46	-.048	-.073	-.103	-.129	-.142	-.181	-.206	-.234	-.248	-.296
47	---	---	---	---	---	---	---	---	---	---
48	-.054	-.080	-.102	-.126	-.138	-.169	-.202	-.231	-.253	-.255
49	-.242	-.163	-.080	-.005	.076	.164	.257	.335	.414	.475
50	---	---	---	---	---	---	---	---	---	---
51	---	---	---	---	---	---	---	---	---	---
52	-.200	-.171	-.135	-.095	-.057	-.001	.066	.139	.216	.283
53	-.162	-.150	-.126	-.093	-.061	-.006	.055	.114	.178	.235
54	-.197	-.182	-.160	-.134	-.104	-.066	-.017	.032	.087	.143
55	-.193	-.180	-.163	-.139	-.114	-.084	-.037	.007	.052	.091
56	---	---	---	---	---	---	---	---	---	---
57	-.154	-.161	-.151	-.140	-.126	-.101	-.068	-.029	.017	.057
58	-.193	-.193	-.181	-.163	-.139	-.111	-.067	-.033	-.014	.054
59	.192	.097	-.010	-.071	-.139	-.241	-.343	-.428	-.495	-.553
60	.042	-.015	-.104	-.183	-.243	-.333	-.410	-.477	-.531	-.579
61	.023	-.030	-.086	-.139	-.195	-.288	-.371	-.438	-.474	-.547
62	.019	-.028	-.075	-.123	-.176	-.290	-.378	-.443	-.506	-.552
63	.001	-.036	-.076	-.102	-.119	-.165	-.286	-.380	-.441	-.488
64	.030	-.067	-.097	-.119	-.136	-.174	-.216	-.307	-.382	-.440
65	-.094	-.116	-.142	-.170	-.179	-.215	-.246	-.310	-.380	-.443
66	-.107	-.135	-.158	-.178	-.193	-.218	-.251	-.298	-.348	-.404

Orifice No	Angle of attack									
	-3°	-1°	0	1°	2°	4°	6°	8°	10°	12°
67	---	---	---	---	---	---	---	---	---	---
68	-0.098	-0.129	-0.151	-0.163	-0.178	-0.207	-0.236	-0.286	-0.346	-0.415
69	-.072	-.092	-.111	-.131	-.146	-.178	-.199	-.234	-.257	-.298
70	---	---	---	---	---	---	---	---	---	---
71	---	---	---	---	---	---	---	---	---	---
72	-.289	-.250	-.198	-.150	-.101	-.023	.068	.158	.233	.310
73	-.253	-.217	-.160	-.109	-.068	.001	.073	.156	.219	.286
74	---	---	---	---	---	---	---	---	---	---
75	-.201	-.193	-.170	-.138	-.112	-.067	-.011	.055	.103	.166
76	-.210	-.193	-.174	-.156	-.137	-.100	-.047	.019	.066	.120
77	-.216	-.203	-.188	-.172	-.156	-.129	-.076	-.015	.025	.068
78	-.175	-.154	-.137	-.127	-.102	-.063	-.012	.035	.063	.100
79	-.207	-.190	-.178	-.164	-.140	-.102	-.055	-.009	.027	.070
80	-.210	-.196	-.183	-.167	-.148	-.115	-.077	-.039	-.005	.038
81	.220	.136	.030	-.065	-.143	-.272	-.378	-.457	-.526	-.576
82	.041	-.031	-.100	-.189	-.255	-.341	-.424	-.481	-.541	-.582
83	-.002	-.054	-.117	-.192	-.269	-.360	-.439	-.504	-.558	-.585
84	.005	-.033	-.083	-.133	-.190	-.301	-.391	-.458	-.523	-.558
85	-.011	-.037	-.078	-.114	-.145	-.235	-.331	-.406	-.472	-.513
86	-.088	-.109	-.136	-.155	-.177	-.209	-.260	-.325	-.389	-.450
87	-.178	-.197	-.221	-.242	-.257	-.283	-.312	-.343	-.386	-.446
88	-.177	-.193	-.207	-.213	-.225	-.244	-.273	-.290	-.328	-.398
89	-.152	-.170	-.079	-.209	-.224	-.241	-.243	-.134	-.261	-.359
90	-.311	-.199	-.086	.013	.087	.186	.287	.367	.427	.479
91	-.365	-.296	-.210	-.148	-.091	-.009	.090	.179	.249	.330
92	-.388	-.351	-.258	-.192	-.127	-.033	.039	.144	.212	.283
93	-.297	-.258	-.202	-.139	-.091	-.023	.060	.143	.204	.275
94	-.234	-.217	-.186	-.147	-.112	-.076	-.024	.035	.083	.139
95	-.255	-.241	-.222	-.203	-.184	-.158	-.114	-.058	-.019	.030
96	-.264	-.245	-.225	-.207	-.188	-.162	-.114	-.055	.003	.037
97	-.226	-.213	-.204	-.195	-.183	-.156	-.110	-.065	-.027	.020
98	-.229	-.212	-.203	-.192	-.186	-.162	-.118	-.075	-.035	.008

NACA

TABLE IV.- CONTINUED

(c) Basic model, M = 1.7

Orfice No	Angle of attack -3°	-1°	0°	1°	2°	4°	6°	8°	10°	12°
0	1.561	1.587	1.598	1.571	1.595	1.601	1.588	1.575	1.557	1.543
1	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
2	.507	.457	.439	.405	.376	.334	.291	.246	.207	.167
3	.419	.379	.356	.324	.302	.264	.224	.188	.152	.115
4	.489	.436	.417	.380	.356	.322	.277	.243	.203	.167
5	.631	.581	.561	.521	.500	.466	.415	.365	.322	.281
6	.190	.156	.144	.118	.097	.079	.040	.010	-.018	-.041
7	-.124	-.150	-.162	-.175	-.189	-.197	-.219	-.230	-.245	-.249
8	-.080	-.065	-.099	-.113	-.131	-.103	-.051	-.025	-.003	.008
9	.053	.026	.039	.044	.046	.049	.051	.053	.035	.023
10	.055	.030	.037	.033	.024	.016	-.010	-.026	-.058	-.087
11	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
12	.207	.380	.263	.289	.307	.361	.414	.520	.522	.576
13	.013	.028	.047	.068	.076	.116	.158	.196	.240	.283
14	-.005	.007	.020	.038	.050	.079	.118	.149	.187	.226
15	.195	.179	.176	.166	.161	.165	.169	.168	.175	.188
16	-.019	-.016	-.005	.020	.029	.063	.112	.148	.194	.240
17	.725	.661	.638	.599	.595	.512	.407	.389	.322	.222
18	.198	.144	.120	.101	.086	.046	-.041	-.075	-.103	-.149
19	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
20	-.073	-.113	-.126	-.148	-.172	-.196	-.219	-.241	-.266	-.288
21	-.036	-.071	-.085	-.108	-.131	-.158	-.190	-.217	-.246	-.273
22	.069	.037	.030	.016	.004	-.019	-.045	-.072	-.102	-.148
23	.053	.021	.038	-.008	-.027	-.039	-.065	-.088	-.109	-.131
24	.054	.024	.008	-.003	-.022	-.034	-.057	-.078	-.104	-.124
25	.045	.008	.001	-.015	-.029	-.043	-.069	-.092	-.115	-.140
26	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
27	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
28	-.123	-.146	-.151	-.161	-.176	-.185	-.203	-.217	-.234	-.254
29	-.037	.002	.048	.124	.160	.250	.318	.379	.550	.647
30	-.128	-.160	-.129	-.097	-.076	-.087	.055	.111	.234	.324
31	-.171	-.156	-.129	-.085	-.060	-.013	.042	.085	.122	.166
32	-.046	-.039	-.021	-.005	.004	.033	.075	.109	.150	.196
33	-.048	-.032	-.019	.009	.025	.061	.112	.154	.197	.248
34	-.056	-.041	-.030	-.008	.005	.054	.099	.140	.180	.243
34A	-.071	-.054	-.045	-.005	.001	.048	.097	.141	.181	.235
35	-0.063	-0.056	-0.034	-0.012	0.006	0.046	0.097	0.136	0.176	0.224
36	-.081	-.070	-.051	-.024	-.015	.034	.075	.112	.152	.204
37	-.136	-.127	-.115	-.095	-.072	-.044	-.006	.029	.071	.114
38	-.198	-.197	-.191	-.177	.165	-.150	-.119	-.095	-.067	-.035
39	.178	.110	.090	.050	.016	-.031	-.091	-.147	-.202	-.252
40	.040	-.011	-.032	-.068	-.100	-.135	-.181	-.218	-.255	-.297
41	-.011	-.064	-.093	-.120	-.146	-.179	-.224	-.261	-.290	-.317
42	.023	-.036	-.067	-.110	-.142	-.181	-.227	-.266	-.304	-.337
43	.042	.009	-.001	-.051	-.143	-.146	-.198	-.248	-.282	-.316
44	-.026	-.054	-.067	-.080	-.090	-.114	-.137	-.164	-.234	-.302
45	-.028	-.062	-.068	-.090	-.108	-.122	-.147	-.170	-.186	-.261
46	-.026	-.051	-.064	-.079	-.088	-.113	-.134	-.152	-.173	-.219
47	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
48	-.018	-.048	-.062	-.078	-.096	-.114	-.138	-.156	-.171	-.192
49	-.060	-.034	.004	.059	.098	.195	.295	.366	.441	.513
50	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
51	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
52	-.150	-.114	-.074	-.036	-.018	.035	.103	.157	.219	.283
53	-.083	-.083	-.066	-.037	-.019	.035	.097	.137	.185	.244
54	-.127	-.113	-.095	-.072	-.058	-.013	.043	.082	.129	.179
55	-.123	-.112	-.096	-.073	-.059	-.021	.024	.065	.109	.153
56	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
57	-.049	-.070	-.071	-.059	-.056	-.031	.006	.041	.080	.128
58	-.123	-.121	-.109	-.085	-.073	-.044	.003	.040	.075	.121
59	.221	.157	.126	.085	.045	-.021	-.091	-.161	-.221	-.264
60	.060	.005	-.018	-.057	-.088	-.130	-.184	-.230	-.276	-.312
61	-.011	-.057	-.086	-.113	-.140	-.179	-.220	-.259	-.293	-.321
62	.005	-.058	-.096	-.128	-.152	-.196	-.235	-.269	-.294	-.322
63	.020	-.040	-.073	-.116	-.145	-.188	-.239	-.278	-.296	-.341
64	.019	-.020	-.041	-.094	-.134	-.178	-.224	-.267	-.301	-.326
65	-.035	-.071	-.075	-.095	-.120	-.177	-.225	-.262	-.293	-.318
66	-.052	-.086	-.094	-.112	-.118	-.168	-.217	-.244	-.276	-.300
67	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
68	-.057	-.096	-.103	-.119	-.126	-.169	-.222	-.233	-.251	-.282
69	-.024	-.054	-.080	-.097	-.113	-.135	-.158	-.176	-.205	-.232
70	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
71	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
72	-0.187	-0.158	-0.131	-0.071	-0.041	0.023	0.100	0.168	0.241	0.349
73	-.174	-.141	-.108	-.051	.020	.045	.111	.171	.236	.304
74	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
75	-.157	-.126	-.106	-.073	-.055	-.016	.048	.091	.144	.199
76	-.128	-.124	-.115	-.085	-.072	-.036	.019	.069	.113	.166
77	-.141	-.132	-.132	-.109	-.097	-.062	-.003	.036	.087	.140
78	-.109	-.107	-.102	-.077	-.056	-.017	.036	.071	.112	.158
79	-.142	-.140	-.137	-.110	-.098	-.070	-.021	.018	.060	.108
80	-.149	-.145	-.134	-.111	-.099	-.071	-.027	.008	.052	.089
81	.278	.203	.160	.119	.066	-.021	-.120	-.191	-.251	-.308
82	.074	.019	-.013	-.047	-.082	-.135	-.196	-.241	-.285	-.330
83	.010	-.041	-.076	-.098	-.132	-.175	-.143	-.274	-.313	-.351
84	0	-.055	.091	-.111	-.150	-.193	-.150	-.280	-.314	-.352
85	.017	-.052	-.092	-.118	-.148	-.187	-.142	-.258	-.270	-.325
86	.005	-.044	-.083	-.133	-.174	-.220	-.162	-.287	-.316	-.347
87	-.065	-.097	-.115	-.139	-.184	-.231	-.172	-.313	-.340	-.364
88	-.089	-.110	-.123	-.135	-.173	-.227	-.170	-.305	-.334	-.356
89	-.094	-.111	-.121	-.129	-.154	-.209	-.163	-.289	-.298	-.301
90	-.042	.018	.058	.137	.185	.263	.206	.410	.476	.532
91	-.136	-.111	-.088	-.014	.010	.089	.091	.223	.287	.356
92	-.184	-.146	-.123	-.070	-.043	.020	.057	.173	.242	.309
93	-.185	-.163	-.124	-.074	-.039	-.019	.056	.172	.235	.299
94	-.141	-.140	-.129	-.081	-.054	-.017	.027	.111	.166	.226
95	-.187	-.165	-.151	-.112	-.096	-.068	-.022	.012	.056	.091
96	-.193	-.173	-.166	-.118	-.088	-.068	-.029	.015	.059	.117
97	-.185	-.164	-.155	-.130	-.119	-.091	-.033	.004	.036	.084
98	-.174	-.163	-.156	-.132	-.120	-.094	-.041	-.019	.044	.067

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TABLE IV.- CONTINUED

(d) Model with rocket packets, M = 1.2

Orifice No.	Angle of attack					Orifice No.	Angle of attack					Orifice No.	Angle of attack				
	-3°	0°	4°	8°	12°		-3°	0°	4°	8°	12°		-3°	0°	4°	8°	12°
0	1.360	1.375	1.384	1.371	1.384	34	----	----	----	----	----	67	----	----	----	----	----
1	----	----	----	----	----	34A	-.014	.082	.176	.299	.363	68	-.083	-.166	-.246	-.365	-.504
2	.485	.395	.287	.193	.107	35	-.103	-.048	.042	.133	.194	69	-.055	-.151	-.207	-.316	-.407
3	.401	.310	.218	.132	.057	36	-.230	-.164	-.042	.033	.168	70	----	----	----	----	----
4	.608	.569	.436	.307	.212	37	-.248	-.175	-.095	-.019	.032	71	----	----	----	----	----
5	.552	.477	.398	.320	.253	38	-.356	-.333	-.276	-.220	-.198	72	-.368	-.255	-.046	.170	.247
6	-.034	-.094	-.154	-.204	-.250	39	.159	-.123	-.497	-.704	-.745	73	-.347	-.221	-.128	.050	.334
7	-.379	-.426	-.441	.408	-.418	40	.012	-.189	-.506	-.690	-.729	74	----	----	----	----	----
8	.106	.091	.081	.051	.055	41	.033	-.122	-.430	-.644	-.702	75	-.210	-.121	-.008	.091	.149
9	----	----	----	----	----	42	.030	-.094	-.212	-.560	-.673	76	-.201	-.133	-.037	.042	.107
10	.049	-.013	-.080	-.126	-.174	43	-.016	-.112	-.222	-.382	-.646	77	-.163	-.152	-.073	.004	.068
11	----	----	----	----	----	44	-.064	-.155	-.255	-.310	-.333	78	-.173	-.115	-.034	.043	.086
12	.114	.193	.309	.424	.530	45	-.085	-.151	-.227	-.289	-.305	79	-.185	-.151	-.079	-.012	.065
13	-.060	-.036	.060	.157	.245	46	-.059	-.134	-.213	-.267	-.306	80	-.134	-.149	-.113	-.044	.101
14	-.073	-.030	.047	.134	.201	47	----	----	----	----	----	81	.162	-.146	-.577	-.726	-.727
15	.226	.234	.256	.263	.271	48	-.018	-.138	-.194	-.254	-.287	82	.003	-.252	-.576	-.704	-.720
16	.003	.059	.174	.271	.308	49	-.117	.065	.268	.384	.517	83	-.038	-.220	-.557	-.692	-.709
17	.505	.328	.153	-.031	-.162	50	----	----	----	----	----	84	-.025	-.170	-.458	-.619	-.682
18	.013	-.153	-.345	-.474	-.575	51	----	----	----	----	----	85	-.040	-.144	-.304	-.527	-.644
19	----	----	----	----	----	52	-.307	-.209	-.058	.164	.299	86	-.110	-.210	-.296	-.445	-.579
20	-.141	-.250	-.381	-.496	-.593	53	-.367	-.243	-.020	.116	.167	87	-.207	-.301	-.373	-.445	-.562
21	.034	-.060	-.135	-.227	-.397	54	-.177	-.108	0	.085	.158	88	-.167	-.244	-.297	-.337	-.511
22	.082	.007	-.080	-.167	-.247	55	-.173	-.126	-.049	.015	.071	89	-.109	-.209	-.244	-.276	.493
23	.058	-.016	-.108	-.182	-.256	56	----	----	----	----	----	90	-.297	-.060	.212	.387	.476
24	.044	-.034	-.108	-.183	-.250	57	-.157	-.103	-.029	.033	.050	91	-.363	-.166	.011	.186	.351
25	.051	-.035	-.125	-.203	-.265	58	-.185	-.157	-.083	-.005	.052	92	-.365	-.247	-.049	.203	.310
26	----	----	----	----	----	59	.129	-.168	-.610	-.753	-.753	93	-.351	-.213	.007	.206	.275
27	----	----	----	----	----	60	.002	-.246	-.577	-.715	-.752	94	-.251	-.110	.056	.135	.169
28	-.305	-.337	-.336	-.220	-.239	61	-.019	-.210	-.558	-.701	-.729	95	-.251	-.201	-.123	-.041	.017
29	-.400	-.285	-.045	.183	.408	62	-.027	-.143	-.287	-.653	-.708	96	-.252	-.188	-.131	-.051	.004
30	-.394	-.270	-.063	.133	.217	63	-.030	-.139	-.272	-.581	-.668	97	-.202	-.169	-.129	-.050	.025
31	-.155	-.087	-.012	.096	.244	64	-.061	-.157	-.271	-.518	-.642	98	-.147	-.166	-.146	-.067	.002
32	.224	.244	.290	.326	.357	65	-.105	-.203	-.313	-.475	-.635						
33	-.343	-.285	-.134	.039	.087	66	-.131	-.197	-.301	-.417	-.560						

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TABLE IV.- CONTINUED

(e) Model with rocket packets, M = 1.3

Orifice No.	Angle of attack					Orifice No.	Angle of attack					Orifice No.	Angle of attack				
	-3°	0°	4°	8°	12°		-3°	0°	4°	8°	12°		-3°	0°	4°	8°	12°
0	1.417	1.442	1.440	1.428	1.407	34	----	----	----	----	----	67	----	----	----	----	----
1	----	----	----	----	----	34A	.047	.012	.124	.245	.395	68	-.099	-.139	-.210	-.262	-.414
2	.508	.431	.321	.228	.151	35	-.093	-.046	.041	.134	.236	69	-.060	-.115	-.175	-.226	-.315
3	.419	.346	.247	.163	.083	36	-.209	-.162	-.075	.026	.135	70	----	----	----	----	----
4	.640	.522	.377	.278	.205	37	-.258	-.220	-.128	-.030	.047	71	----	----	----	----	----
5	.585	.518	.417	.337	.266	38	-.320	-.309	-.269	-.222	-.156	72	-.310	-.226	-.092	.146	.268
6	.040	-.012	-.053	-.128	-.176	39	.128	-.023	-.255	-.434	-.551	73	-.325	-.233	-.084	.003	.209
7	-.293	-.334	-.378	-.396	-.371	40	.043	-.105	-.303	-.453	-.550	74	----	----	----	----	----
8	-.020	.057	.065	.081	.055	41	-.011	-.061	-.267	-.444	-.544	75	-.226	-.141	-.040	.082	.178
9	----	----	----	----	----	42	-.008	-.054	-.154	-.355	-.507	76	-.210	-.155	-.065	.038	.125
10	.054	.009	-.050	-.101	-.155	43	.003	-.065	-.155	-.296	-.431	77	-.209	-.171	-.084	.015	.089
11	----	----	----	----	----	44	-.068	-.127	-.204	-.273	-.381	78	-.176	-.124	-.043	.051	.123
12	.143	.226	.325	.445	.561	45	-.084	-.126	-.200	-.265	-.277	79	-.195	-.156	-.075	-.003	.054
13	-.055	-.004	.066	.158	.265	46	-.050	-.107	-.182	-.235	-.256	80	-.194	-.162	-.092	-.035	.024
14	-.055	-.011	.052	.132	.225	47	----	----	----	----	----	81	.180	-.034	-.285	-.453	-.565
15	.220	.231	.232	.252	.267	48	-.062	-.106	-.172	-.238	-.268	82	-.024	-.136	-.348	-.485	-.567
16	-.046	-.009	.085	.231	.348	49	-.226	.023	.209	.358	.446	83	-.016	-.141	-.358	-.500	-.578
17	.580	.450	.288	.125	-.027	50	----	----	----	----	----	84	.004	-.098	-.315	-.466	-.562
18	.060	-.054	-.192	-.315	-.419	51	----	----	----	----	----	85	-.012	-.086	-.246	-.425	-.524
19	----	----	----	----	----	52	-.274	-.172	-.025	.085	.292	86	-.085	-.138	-.208	-.350	-.464
20	-.139	-.218	-.312	-.409	-.487	53	-.324	-.299	-.170	.053	.183	87	-.174	-.228	-.282	-.358	-.464
21	-.027	-.089	-.196	-.291	-.397	54	-.175	-.115	-.036	.072	.170	88	-.173	-.209	-.229	-.298	-.415
22	.071	.018	-.065	-.137	-.202	55	-.177	-.136	-.064	.021	.095	89	-.140	-.191	-.223	-.238	-.390
23	.054	.005	-.082	-.150	-.209	56	----	----	----	----	----	90	-.227	-.045	.174	.357	.465
24	.041	-.005	-.082	-.150	-.207	57	-.126	-.131	-.087	-.015	.061	91	-.311	-.192	-.013	.154	.300
25	.026	-.020	-.096	-.163	-.219	58	-.173	-.159	-.095	-.017	.062	92	-.321	-.218	-.062	.067	.325
26	----	----	----	----	----	59	.169	-.050	-.316	-.483	-.590	93	-.307	-.236	-.087	.138	.304
27	----	----	----	----	----	60	.025	-.151	-.369	-.511	-.592	94	-.267	-.229	-.086	.073	.193
28	-.260	-.296	-.337	-.408	-.412	61	.006	-.114	-.316	-.468	-.561	95	-.284	-.212	-.136	-.044	.032
29	-.313	-.227	-.019	.214	.443	62	.008	-.093	-.314	-.462	-.559	96	-.266	-.208	-.135	-.042	.032
30	-.345	-.353	-.239	-.036	.190	63	-.008	-.093	-.180	-.418	-.528	97	-.235	-.190	-.131	-.045	.031
31	-.235	-.089	-.030	.062	.171	64	-.042	-.102	-.178	-.348	-.467	98	-.216	-.189	-.134	-.062	.006
32	.230	.283	.327	.361	.397	65	-.095	-.142	-.218	-.322	-.457						
33	-.348	-.303	-.207	-.052	.134	66	-.114	-.158	-.228	-.301	-.418						

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TABLE IV.- CONCLUDED
(f) Model with rocket packets, M = 1.7

Orifice No.	Angle of attack -3°	0°	4°	8°	12°
0	1.573	1.584	1.566	1.578	1.535
1	----	----	----	----	----
2	.506	.433	.338	.255	.175
3	.420	.351	.263	.190	.119
4	.489	.413	.314	.241	.172
5	.633	.556	.454	.367	.285
6	.195	.141	.074	.021	-.030
7	-.117	-.152	-.186	-.218	-.236
8	-.062	-.105	-.087	-.030	.006
9	----	----	----	----	----
10	.056	.038	.017	-.023	-.079
11	----	----	----	----	----
12	.208	.258	.360	.467	.470
13	.017	.047	.111	.191	.246
14	.004	0	.072	.140	.227
15	.193	.124	.170	.173	.189
16	-.040	-.026	.044	.115	.204
17	.723	.636	.488	.391	.222
18	.199	.128	.046	-.046	-.128
19	----	----	----	----	----
20	-.090	-.146	-.182	-.229	-.269
21	-.026	-.105	-.149	-.210	-.254
22	.075	.035	-.016	-.071	-.151
23	.054	.005	-.059	-.089	-.135
24	.053	.010	-.059	-.089	-.131
25	.036	-.008	-.059	-.107	-.144
26	----	----	----	----	----
27	----	----	----	----	----
28	-.113	-.148	-.168	-.215	-.249
29	-.027	.060	.237	.376	.640
30	-.081	-.097	.046	.080	.274
31	-.146	-.113	.046	.077	.154
32	-.008	-.007	.096	.346	.490

Orifice No.	Angle of attack -3°	0°	4°	8°	12°
33	-.141	-.150	-.115	-.045	.056
34	----	----	----	----	----
34A	-.026	-.018	.017	.162	.249
35	.046	-.029	.049	.166	.271
36	-.039	-.021	.045	.114	.201
37	-.171	-.166	-.114	-.044	.060
38	-.183	-.186	-.155	-.101	-.038
39	.176	.086	-.029	-.139	-.233
40	.036	-.032	-.119	-.193	-.262
41	-.014	-.089	-.165	-.238	-.294
42	.028	-.073	-.167	-.245	-.310
43	.050	-.008	-.128	-.220	-.290
44	-.023	-.069	-.115	-.162	-.269
45	-.026	-.077	-.125	-.163	-.246
46	-.020	-.064	-.112	-.150	-.201
47	----	----	----	----	----
48	-.014	-.063	-.113	-.148	-.181
49	-.029	.009	.157	.365	.490
50	----	----	----	----	----
51	----	----	----	----	----
52	-.006	.026	.090	.213	.383
53	-.212	-.185	-.105	-.003	.093
54	-.091	-.052	-.016	.081	.175
55	-.098	-.092	-.030	.045	.143
56	----	----	----	----	----
57	-.010	-.045	-.025	.027	.103
58	-.114	-.105	-.049	.026	.113
59	.221	.115	-.035	-.175	-.270
60	.062	-.027	-.126	-.223	-.299
61	-.005	-.077	-.163	-.241	-.301
62	.004	-.081	-.178	-.249	-.303
63	.023	-.071	-.172	-.253	-.313
64	.008	-.056	-.155	-.238	-.293

Orifice No.	Angle of attack -3°	0°	4°	8°	12°
65	-.033	-.081	-.168	-.238	-.292
66	-.048	-.084	-.175	-.221	-.276
67	----	----	----	----	----
68	-.063	-.103	-.186	-.219	-.265
69	.019	-.069	-.121	-.163	-.203
70	----	----	----	----	----
71	----	----	----	----	----
72	-.146	-.146	-.059	.115	.275
73	-.215	-.151	-.003	.094	.238
74	----	----	----	----	----
75	-.107	-.084	-.015	.072	.193
76	-.117	-.117	-.057	.054	.141
77	-.138	-.137	-.051	.030	.112
78	-.114	-.098	-.015	.058	.144
79	-.136	-.120	-.066	.003	.089
80	-.137	-.123	-.078	-.003	.086
81	.247	.133	.004	-.156	-.254
82	.057	-.023	-.102	-.220	-.292
83	.003	-.076	-.168	-.247	-.312
84	-.002	-.084	-.170	-.252	-.312
85	.015	-.083	-.164	-.232	-.295
86	-.028	-.082	-.181	-.256	-.302
87	-.069	-.120	-.206	-.276	-.329
88	-.088	-.123	-.207	-.277	-.330
89	-.089	-.124	-.198	-.267	-.296
90	.005	.079	.212	.328	.458
91	-.100	-.083	.020	.164	.318
92	.159	-.133	.006	.128	.285
93	-.166	-.119	.012	.108	.247
94	-.100	-.107	-.052	.051	.187
95	-.155	-.143	-.080	-.011	.089
96	-.165	-.146	-.086	-.048	.108
97	-.156	-.143	-.098	.011	.073
98	-.155	-.148	-.106	-.029	.051

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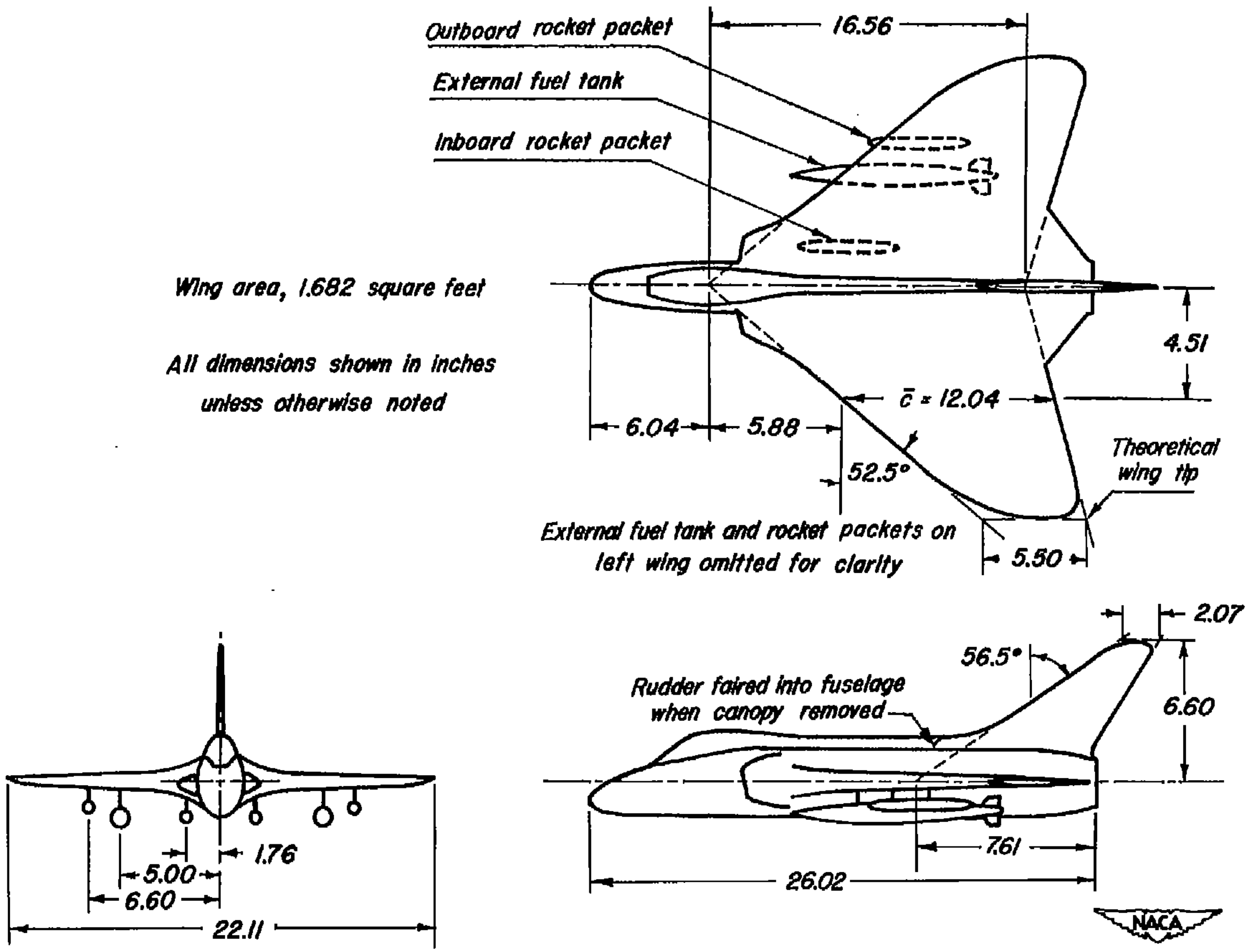


Figure 1.– Three-view drawing of the model showing the external fuel tanks and rocket packets.

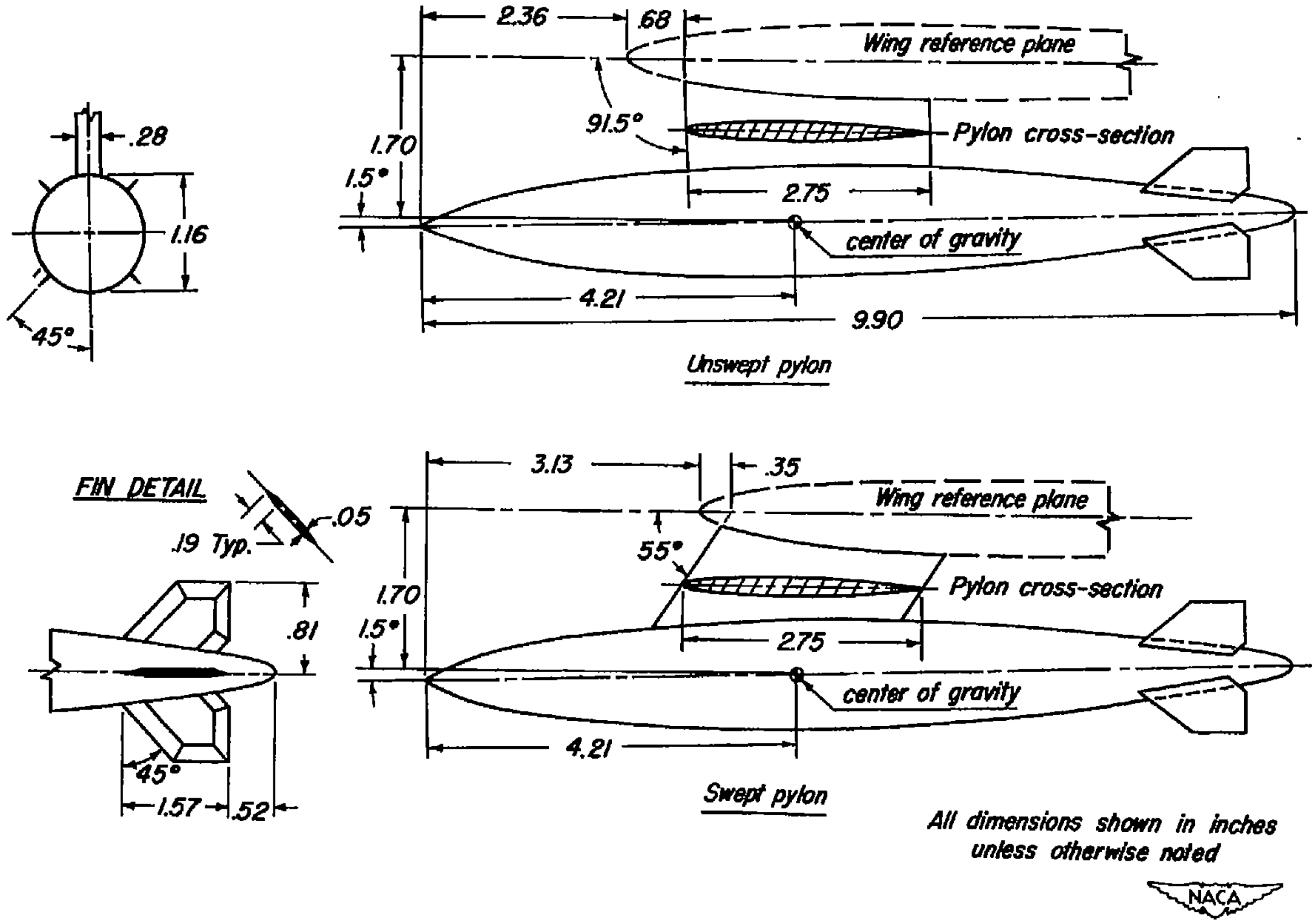
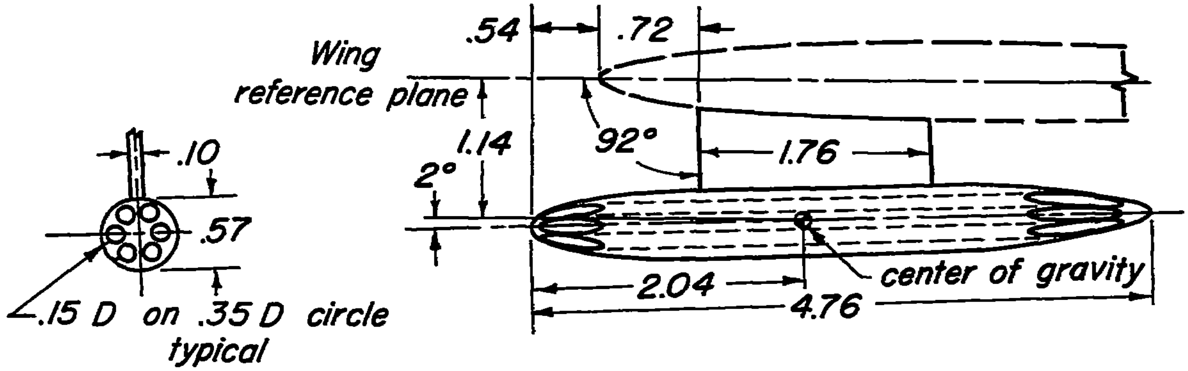
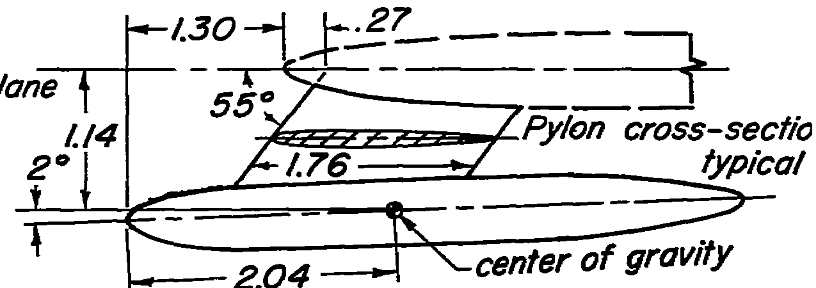


Figure 2.- Details of the external fuel tanks with unswept and swept pylons.



Note: rocket packet shown
with open tubes

Unswept pylon



All dimensions shown in inches
unless otherwise noted

Swept pylon

(a) Outboard location.

Figure 3.– Details of the rocket packets with unswept and swept pylons.

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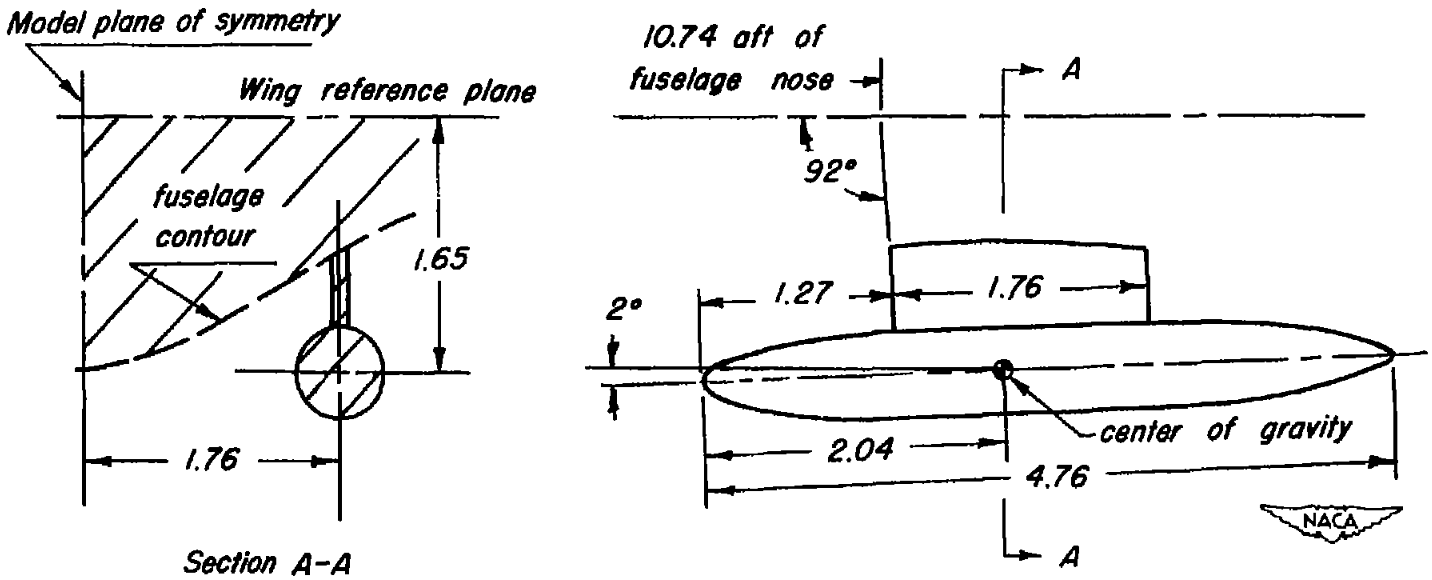

All dimensions shown in inches unless otherwise noted

(b) Inboard location.

Figure 3. – Concluded.

[redacted]

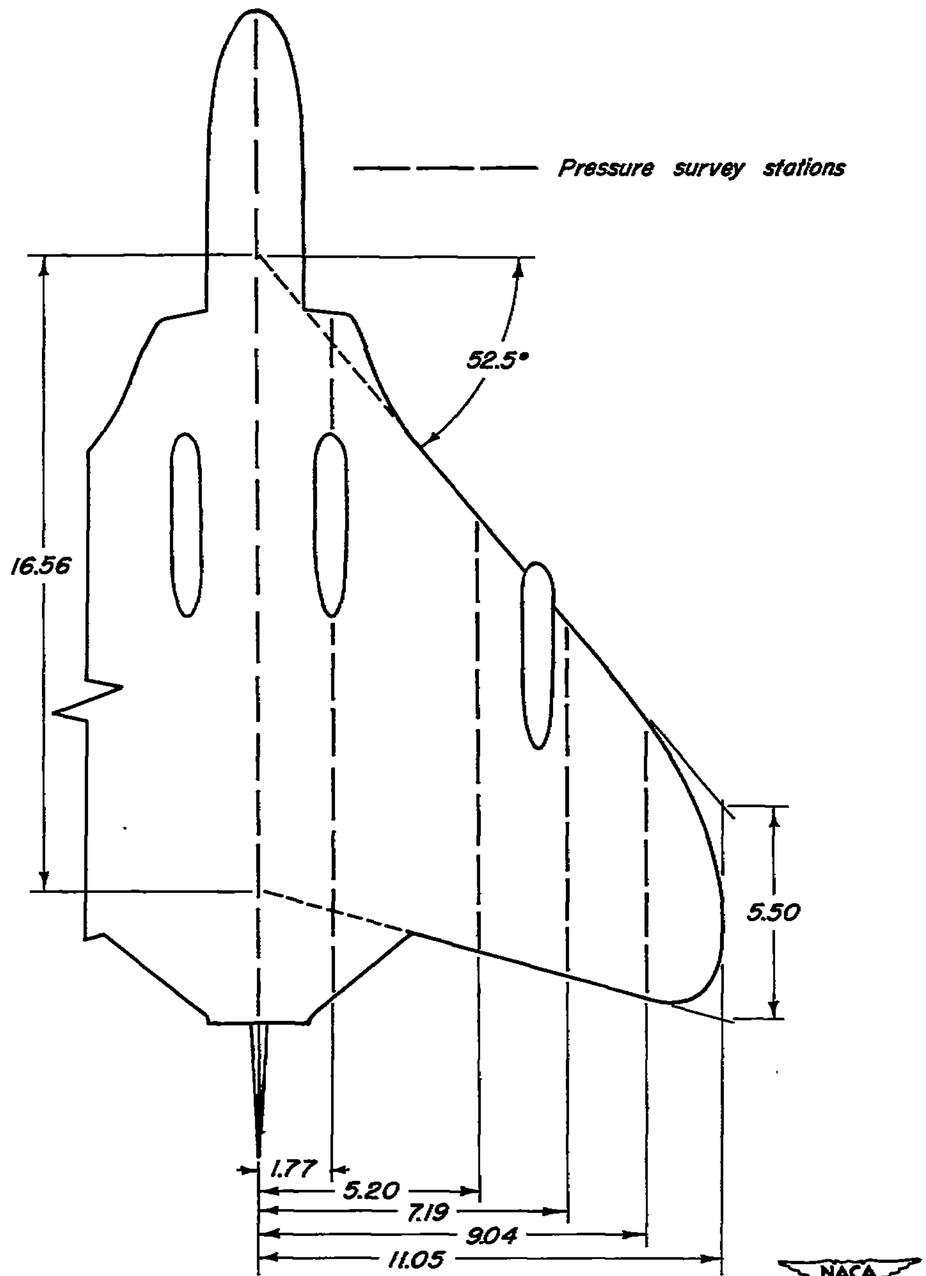

Figure 4.— Dimensionl sketch of the lower surface of the model with rocket packets installed, showing the pressure survey station.

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[redacted]

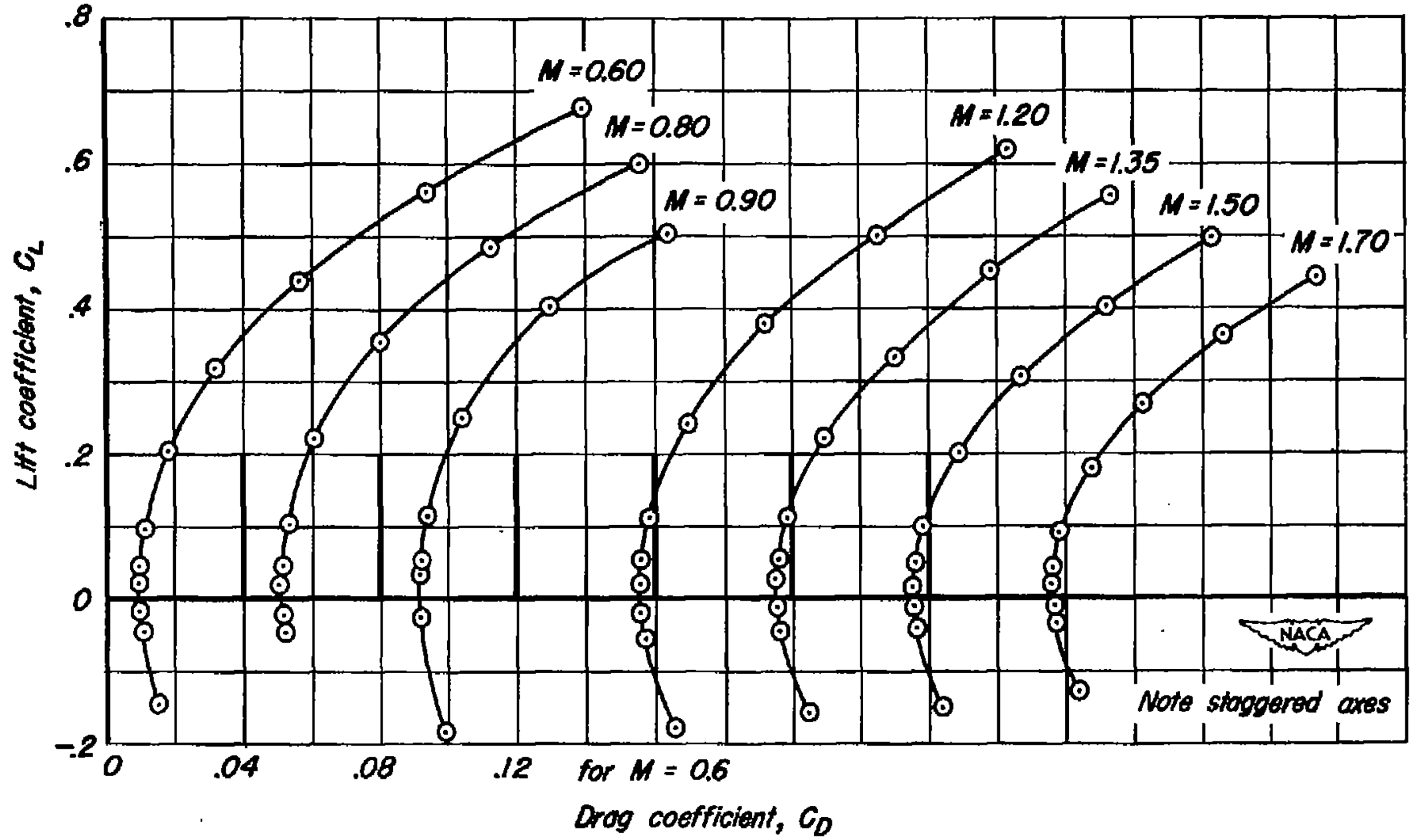
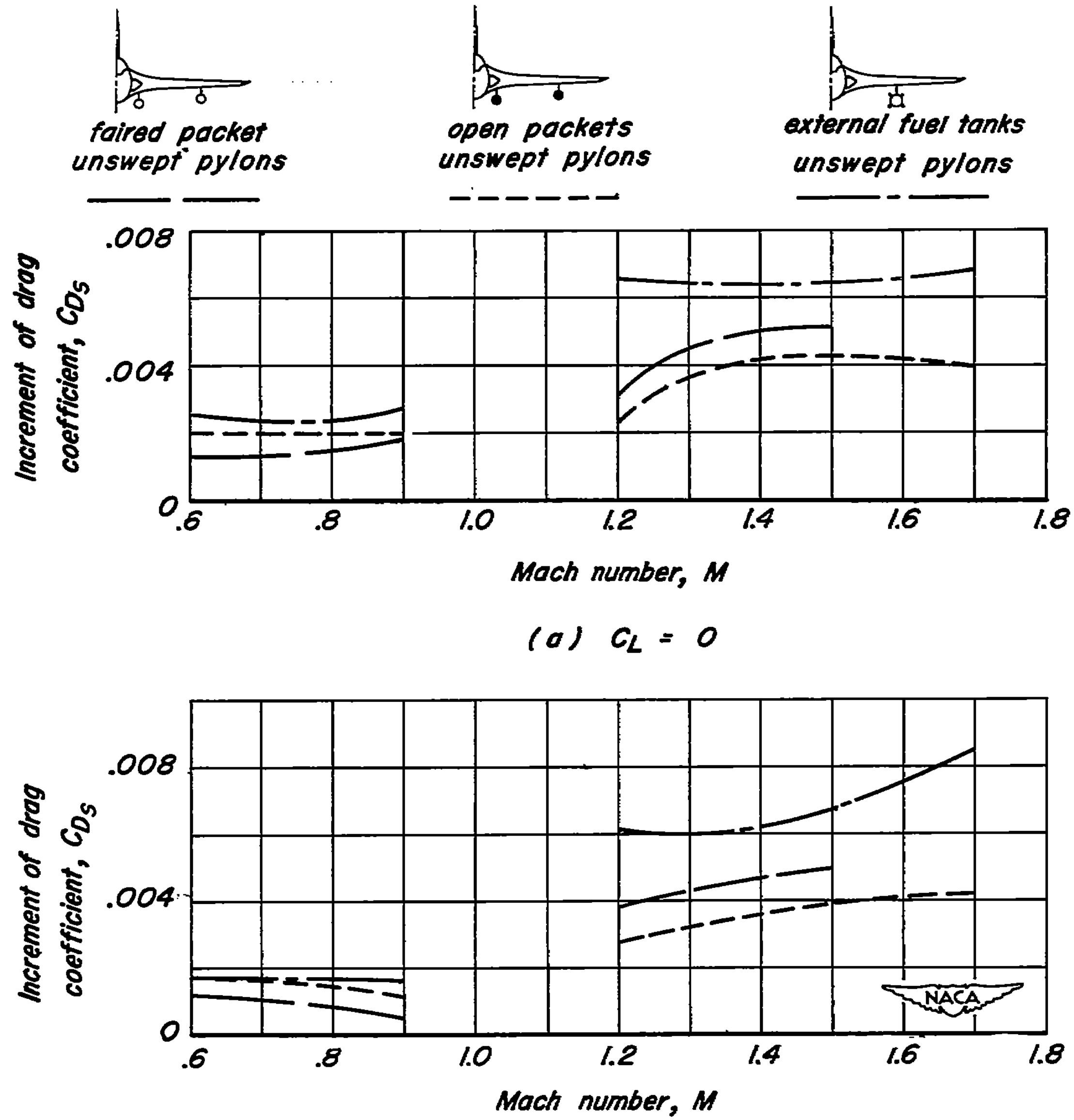


Figure 5.- Variation of drag coefficient with lift coefficient for the basic model.



(b) $C_L = 0.25$

Figure 6.- Variation of increment of drag coefficient with Mach number at 0 and 0.25 lift coefficient for the various external store configurations mounted on the model.

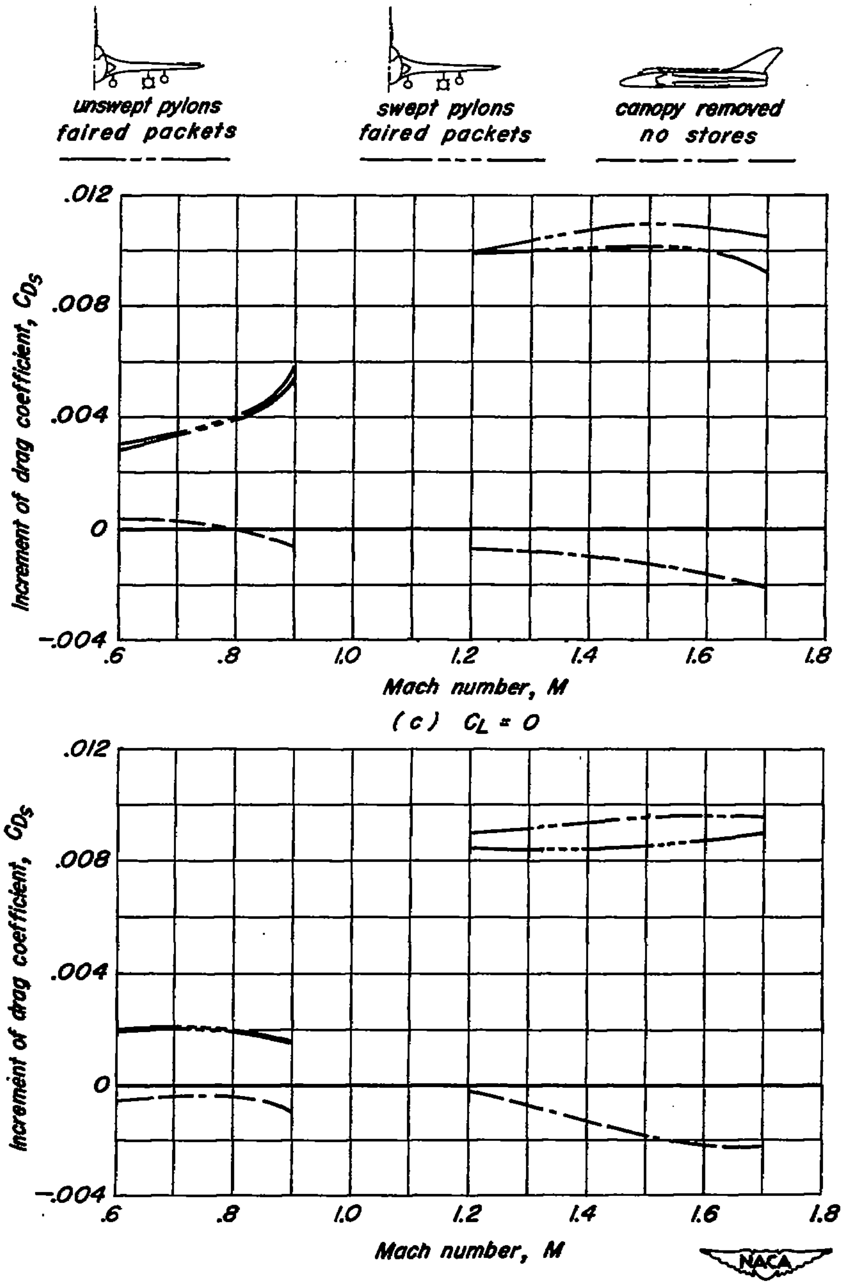


Figure 6.– Concluded.

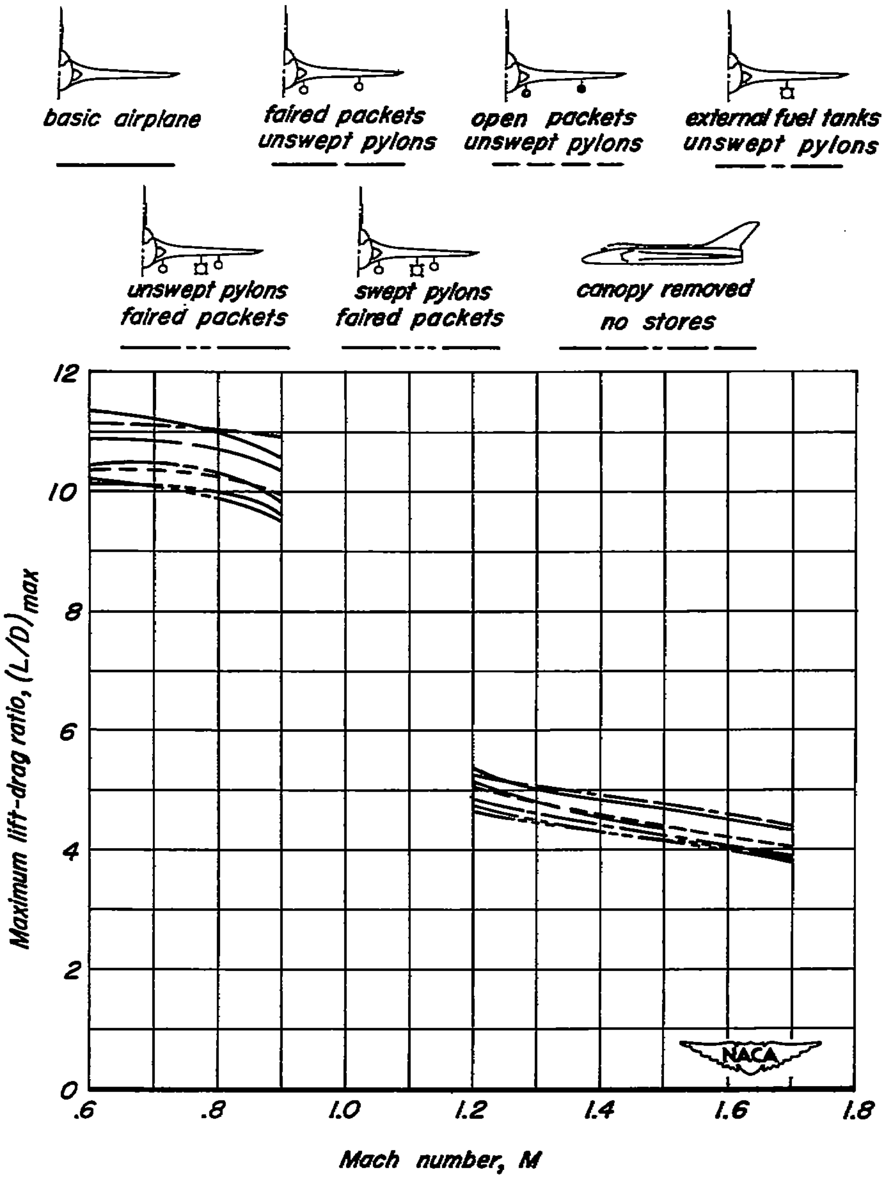


Figure 7.- Variation of the maximum lift-drag ratio with Mach number for the various external store configurations mounted on the model.

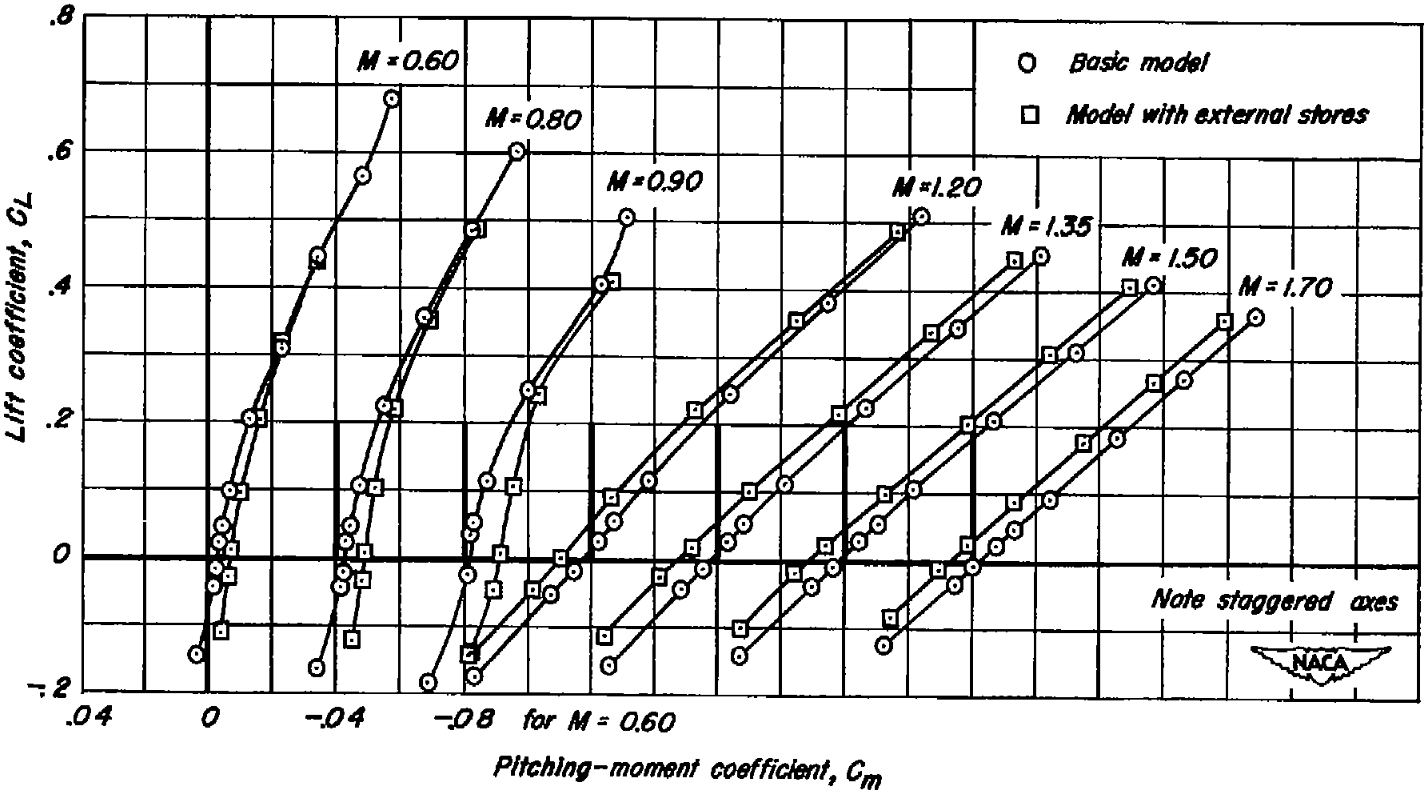


Figure 8.–Variation of pitching-moment coefficient with lift coefficient for the basic model and for the model fitted with two external fuel tanks and four faired rocket packets mounted on unswept pylons.

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